BIOHIT

Innovating for Health

Liquid Handling Products Catalogue 2008

BIOHIT
Innovating for Health

The hummingbird

The sensitive and precise qualities of the hummingbird symbolise Biohit's product groups of liquid handling, diagnostic products, and analysis systems. Biohit's liquid handling products based on the company's innovations and technologies are characterised by versatility, flexibility, power, speed, light weight, quality, robustness and well-engineered design, ergonomics, accuracy, and precision as well as safety in delicate operations.

Biohit Liquid Handling Products

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BIOHIT
Innovating for Health

Liquid handling products for safe, accurate and ergonomic laboratory applications

Made in Finland

Founded in Finland in 1988, Biohit has established its position in the world market with its innovative, high technology liquid handling products. The company's liquid handling range is currently the widest in the world. Biohit continuously develops its products and processes in order to meet and often exceed the demands of regulatory authorities, environmental bodies and most important, its customers.

CE
IVD

Biohit's products are developed and manufactured in Finland according to the requirements of the ISO 9001, ISO 13485, and ISO 14001 quality and environment standards. Biohit also offers accredited pipettor calibration according to ISO 17025. All products are CE/IVD marked and supplied with individual QC certificates.

In the liquid handling business, Biohit focuses on

- Improving ergonomics of pipettor design and usability to reduce the risk of work related upper limb disorders, such as RSI (Repetitive Strain Injury). Biohit is the global market leader in electronic pipettors, which combine performance and ergonomics to provide accurate, reproducible and safe pipetting in the most demanding liquid handling applications.

- Enhancing safety at work – by protecting laboratory workers and the sample to obtain accurate and reliable results. Biohit guarantees the precision and accuracy of its pipettors when the customer uses tips developed and manufactured by Biohit.

- Making no compromise on quality in product development, raw materials, manufacturing processes and after-sales services. The highly skilled, innovative and experienced personnel and strict quality control according to international standards have attributed to the proven track record of Biohit. Global market leaders such as 3M, bioMérieux and Johnson & Johnson Group companies have chosen Biohit to supply tailored, high-quality liquid handling solutions with their systems.

- Providing solutions that bring higher added value to different customer segments, through ergonomic and user-friendly products, cost-efficient product features and service contracts. Furthermore, the low lifetime cost of the products, warranty periods and environmentally friendly products allow for high return on investment.

- Offering high-quality after-sales services, which enable customers to meet tightening quality control requirements and help extend the life-time of their liquid handling devices. The service concept includes preventive maintenance and repair services, standard and accredited calibration, and training services, provided through the extensive subsidiary and distributor network, and the global customer service network of OEM and private-label customers of Biohit.

ISO 9001 • ISO 13485 • ISO 14001 • ISO 17025

www.biohit.com

BIOHIT PROLINE 50-1200µl
BIOHIT
SELECT
UNIT
BIOHIT 300
30-300µl
e300
m300
e300

BIOHIT
Innovating for Health

mLINE®

BIOHIT 3 YEARS WARRANTY

ERGONOMICALLY ed DESIGNED

Optiload
Effortless Tip Loading & Ejection

121°C
Fully autoclavable

CE
IVD

Made in Finland

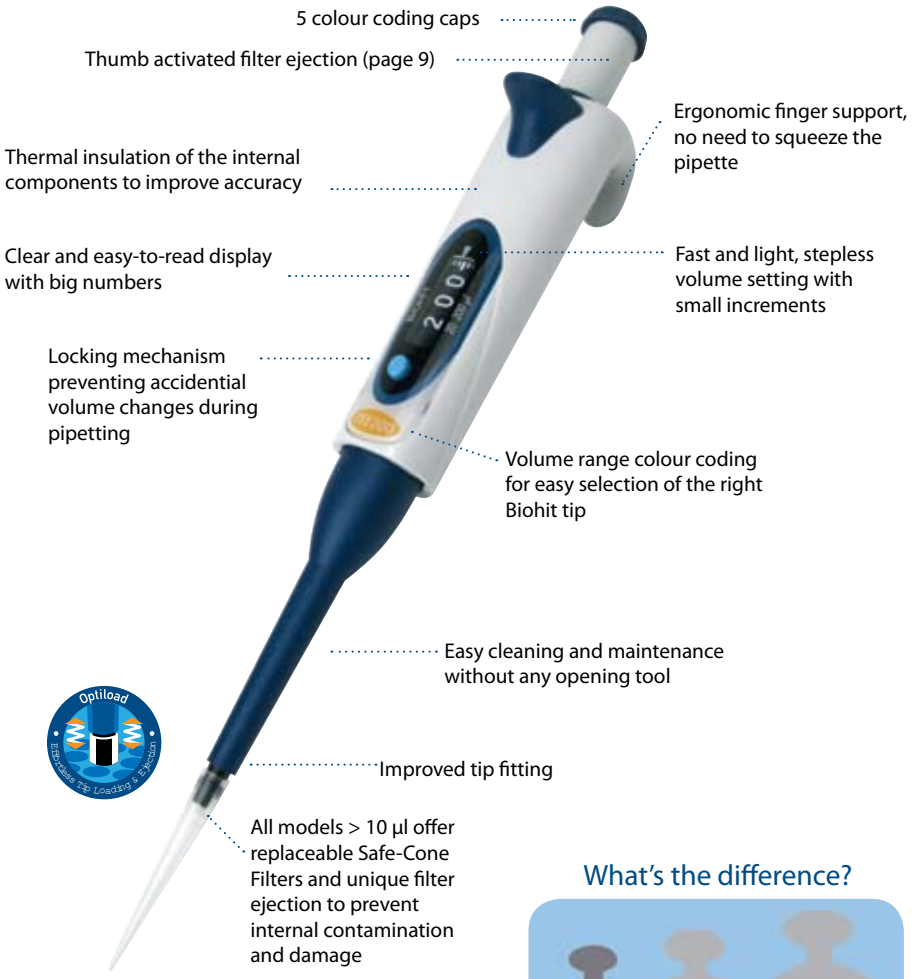
Effortless accuracy – meet the mLINE® family!

Biohit's most advanced mechanical pipettor family – the mLINE – offers a unique combination of novel & patented features for manual pipetting. Excellent performance, smooth ergonomics and perfect safety makes the mLINE. It is comfortable to use, hour after hour, day after day – without the risk of strains (RSI). Enjoy your work. With mLINE pipettors you can. mLINE pipettors cover the full volume range of 0.1 µl to 10 ml.

mLINE for easy and ergonomic pipetting

- The lowest pipetting forces on the market
- Consistent results even in long pipetting series
- Light weight
- Optiload tip loading for perfect tip sealing and effortless tip ejection
- Good UV resistance
- Safe-Cone Filters protect your pipettor and sample
- Recommended by Health & Safety Officers

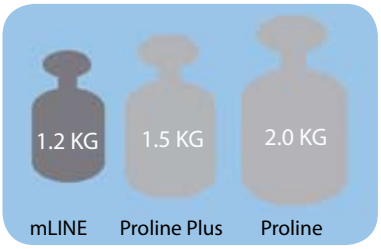
Tips on pages 52-53
Filters on page 56
Pipettor selection guide on page 76
Ergonomics on page 72
Autoclaving instructions on page 81


5 colour coding caps
Thumb activated filter ejection (page 9)
Ergonomic finger support, no need to squeeze the pipette
Thermal insulation of the internal components to improve accuracy
Clear and easy-to-read display with big numbers
Fast and light, stepless volume setting with small increments
Locking mechanism preventing accidential volume changes during pipetting
Volume range colour coding for easy selection of the right Biohit tip
Easy cleaning and maintenance without any opening tool
Optiload
Improved tip fitting
All models > 10 µl offer replaceable Safe-Cone Filters and unique filter ejection to prevent internal contamination and damage

121°C

Fully autoclavable

What's the difference?



Comparison of the pipetting forces needed. See page 76 for the selection guide.

mLINE Single-Channel Performance specifications and ordering details

Cat. No.	Channels	Volume Range (µl)	Increment (µl)	Test Volume (µl)	Inacc. (%)	Impr. (%)	Safe-Cone Filters Standard	Plus	Tip ID
725010	1	0.1-3 µl	0.002	3 1.5 0.3	1.30 % 2.40 % 10.00 %	0.80 % 1.60 % 6.00 %	-	-	A, L, M
725020	1	0.5-10 µl	0.01	10 5 1 0.5	1.00 % 1.50 % 2.50 % 5.00 %	0.60 % 1.00 % 1.50 % 4.00 %	-	-	A, L, M
725030	1	2-20 µl	0.02	20 10 2	0.90 % 1.20 % 3.00 %	0.40 % 1.00 % 2.00 %	721014	-	C, N
725050	1	10-100 µl	0.10	100 50 10	0.80 % 1.00 % 2.00 %	0.15 % 0.40 % 1.00 %	721008	721018	C, D, O, V
725060	1	20-200 µl	0.20	200 100 20	0.60 % 0.80 % 2.00 %	0.15 % 0.30 % 0.80 %	721007	721017	C, D, P, Q
725070	1	100-1000 µl	1.00	1000 500 100	0.60 % 0.60 % 1.00 %	0.20 % 0.20 % 0.40 %	721006	721016	E, G, S
725080	1	500-5000 µl	10.0	5000 2500 500	0.50 % 0.60 % 2.00 %	0.20 % 0.30 % 0.60 %	721005	721015	J
725090	1	1- 10ml	20.0	10000 5000 1000	0.60 % 1.20 % 3.00 %	0.20 % 0.30 % 0.60 %	721005	721015	U

FINAS Accredited Calibration Certificate (ISO 17025) available for new pipettors – see page 65 for details

The specifications are type test specifications achieved under strictly controlled conditions (ISO 8655). Due to Biohit's continuous R&D, specifications may change without prior notice.

Colour coding caps
Thumb activated filter ejection
Light plunger button action
Ergonomic finger support and ID tag for personal identification
Clear and easy-to-read display with big numbers and small increments
Locking mechanism preventing accidental volume changes during pipetting
Rotating dispensing head for optimal pipetting convenience
121°C
Fully autoclavable
All models > 10 µl offer replaceable Safe-Cone Filters and unique filter ejection to prevent internal contamination and damage
Optiload
Individual piston / tip cone assemblies for easy maintenance
Optiload tip loading mechanism for perfect tip sealing and light tip ejection

Tips on pages 52-53
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Autoclaving instructions on page 81

mLINE Multichannel Performance specifications and ordering details

Cat. No.	Channels	Volume Range (µl)	Increment (µl)	Test Volume (µl)	Inacc. (%)	Impr. (%)	Safe-Cone Filters Standard	Safe-Cone Filters Plus	Tip ID
725120	8-channel	0.5-10 µl	0.01	10 5 1	1.50 % 2.50 % 4.00 %	1.00 % 2.50 % 4.00 %	-	-	A, L, M
725130	8-channel	5-100 µl	0.10	100 50 10	0.70 % 1.00 % 3.00 %	0.25 % 0.70 % 1.50 %	721008	721018	C, D, O, V
725140	8-channel	30-300 µl	0.20	300 150 30	0.60 % 1.00 % 2.00 %	0.25 % 0.50 % 1.00 %	721007	721017	D, Q
725220	12-channel	0.5-10 µl	0.01	10 5 1	1.50 % 2.50 % 4.00 %	1.00 % 2.50 % 4.00 %	-	-	A, L, M
725230	12-channel	5-100 µl	0.10	100 50 10	0.70 % 1.00 % 3.00 %	0.25 % 0.70 % 1.50 %	721008	721018	C, D, O, V
725240	12-channel	30-300 µl	0.20	300 150 30	0.60 % 1.00 % 2.00 %	0.25 % 0.50 % 1.00 %	721007	721017	D, Q

The specifications are type test specifications achieved under strictly controlled conditions (ISO 8655). Due to Biohit's continuous R&D, specifications may change without prior notice.

Optiload tip loading and perfect tip sealing

All mLINE pipettors are equipped with unique spring loaded tip cones – the Optiload mechanism that

- Allows tips to be loaded with constant force
- Enables even and safe tip sealing to the tip cone(s) with minimum force
- Makes tip ejection light and easy
- Is an advantage in multichannel models, in particular, where even tip sealing is essential.

Unique protection with Safe-Cone Filters

To prevent contamination of the pipettor and the sample, the mLINE pipettors feature replaceable Safe-Cone Filters. The unique Safe-Cone Filter ejection of mLINE means that the filters can be easily and safely removed by pressing the plunger button. Safe-Cone Filters are available for both single- and multichannel models > 10 µl.

Filters on page 56

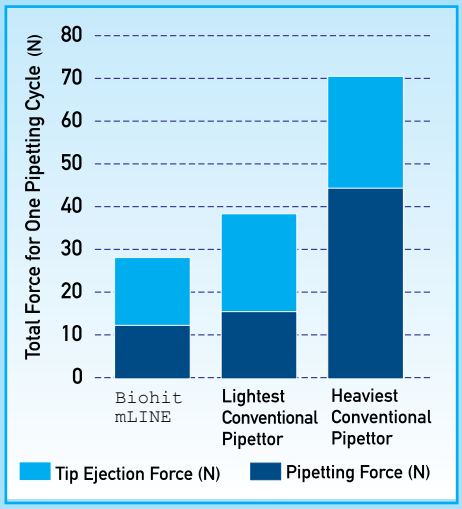
"The qualities that really convinced me to switch to Biohit mLINE are its light weight, lowest pipetting and tip ejection forces, easy to read display, locking mechanism to prevent accidental volume changes and finally, its compatibility to tips currently used at our company."

Richard P. Roque, Preclinical Development,
a Seattle based biotechnology company, USA

Unique spring mechanism for lighter pipetting

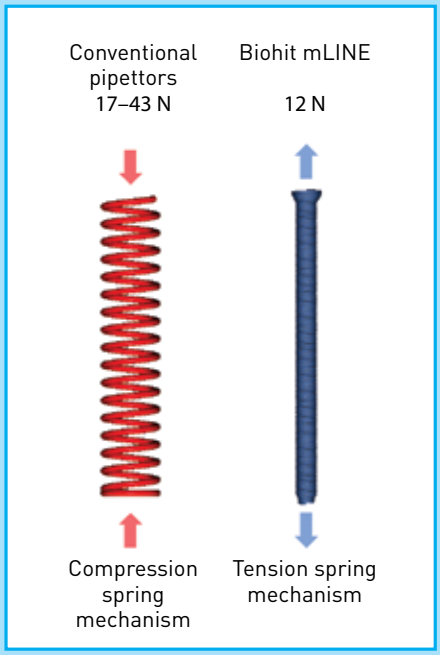
The mLINE pipettor has a patented spring mechanism (plunger technology) resulting in the lowest pipetting forces on the market. This together with light tip ejection force and ergonomic design of the handle reduces the risk of Repetitive Strain Injury (RSI).

Conventional pipettors use compression spring mechanism resulting in heavy pipetting force. The tension spring mechanism used in Biohit mLINE pipettors makes pipetting force almost 4 times lighter. Moreover, thanks to the unique mechanism starting force is always constant regardless of the volume.



Pipetting and tip ejection force comparison of mLINE and other mechanical pipettors. The mLINE provides significantly lighter pipetting and tip ejection forces than any other mechanical pipettor, making the total force for one pipetting cycle (pipetting to tip ejection) the lightest on the market.

Ergonomics on page 72



Easy maintenance and calibration

The mLINE can be easily calibrated using the elegant calibration tool. The tool also acts as a tube cap opener.

The mLINE has been designed for easy cleaning and maintenance without any opening tool. Only 3–4 parts need to be cleaned.

The mLINE should, like any other pipettor, be stored in an upright position. There are several different stand options for mLINE:

- Handy holder that is included with each mLINE pipettor
- Carousel stand for six pipettors
- Stylish linear stand that allows the pipettor to be placed on both sides of the stand

Stands & Accessories

Cat. No.	Item
725600	Carousel Stand for 6 pipettors
725610	Pipettor Holder for one pipettor
725620	Linear Stand
726203	Calibration tool/Tube opener

Get started with mLINE Starter Kit

mLINE® Starter Kit

Biohit mLINE Starter Kit offers an opportunity to test and get started with mLINE. You can choose between two Starter Kits with three single-channel mLINE pipettors. Both kits also include colour coded tip racks for every pipettor and many useful accessories such as pipettor holder, colour coding caps and a calibration tool, which also acts as a tube opener. All this is packaged into the durable Biohit bag.

Biohit mLINE Starter Kit 1 - Cat. No. 725651	
• mLINE 0.5-10 µl	• Biohit Tip 0.2 –10 µl, Single Tray
• mLINE 10-100 µl	• Biohit Tip 0.5-300 µl, Single Tray
• mLINE 100-1000 µl	• Biohit Tip 10-1000 µl, Single Tray
• Pipettor Holder x 3	• Calibration Tool/Tube Opener
• Colour Coding Caps	• mLINE Article
• Biohit Bag	• mLINE Brochure
• Biohit Pen	• Biohit Liquid Handling Catalogue

Biohit mLINE Starter Kit 2 - Cat. No. 725652	
• mLINE 2-20 µl	• Biohit Tip 0.5-300 µl, Single Tray x 2
• mLINE 20-200 µl	• Biohit Tip 10-1000 µl, Single Tray
• mLINE 100-1000 µl	• Calibration Tool/Tube Opener
• Pipettor Holder x 3	• mLINE Article
• Colour Coding Caps	• mLINE Brochure
• Biohit Bag	• Biohit Liquid Handling Catalogue
• Biohit Pen	

BIOHIT
Innovating for Health

Proline® Plus

3 YEARS WARRANTY

ERGONOMICALLY DESIGNED

Optiload
Effortless Tip Loading & Ejection

121°C
Fully autoclavable

CE
IVD

Made in Finland

Durable and dependable – Proline® Plus

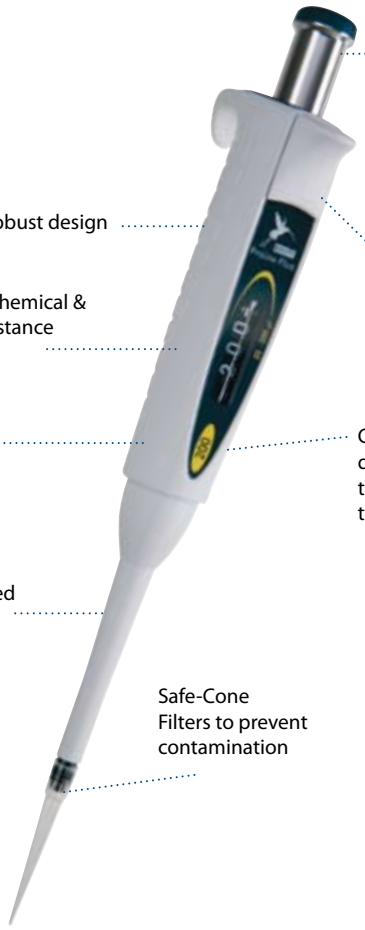
In the new Proline Plus pipettor, Biohit has combined the basic functionalities of the traditional Proline mechanical with new, state-of-the-art pipettor design and technology. Particular emphasis has been put on safety, ergonomics, and efficiency in pipetting, as well as on the high quality of the device. Proline Plus pipettors cover the full volume range of 0.1µl-10ml, in both adjustable and fixed volume models.

Plus Is More!

Proline Plus – the classic Biohit Proline reborn

- Robust design
- Good UV resistance
- Excellent chemical resistance
- Small increments
- Reduced pipetting and tip ejection force
- Fully autoclavable

Fully autoclavable


Volume setting with click stops
Robust design
Suitable for both left and right-handed users
Good chemical & UV resistance
Thermal insulation of the internal components ensures that the warmth of the hand does not affect the pipetting results during long pipetting series
Colour coding on display corresponds to the colour coding of tip trays
Fits the most commonly used lab tubes thanks to the slim tip ejector collar
Safe-Cone Filters to prevent contamination

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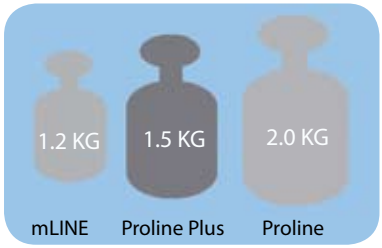
What's the difference?



Comparison of the pipetting forces needed.
See page 76 for selection guide.

Proline®Plus Single channel Performance Specifications and Ordering Details

Cat. No.	Channels	Volume range (µl)	Increment (µl)	Test volume (µl)	Inacc. (%)	Impr. (%)	Safe-Cone Filters Standard	Plus	Tip ID
728010	1	0.1-3 µl	0.002	3,0 1,5 0,3	1.30 % 2.40 % 10.00 %	0.80 % 1.60 % 6.00 %	-	-	A, L, M
728020	1	0.5-10 µl	0.01	10 5 1 0,5	1.00 % 1.50 % 2.50 % 5.00 %	0.60 % 1.00 % 1.50 % 4.00 %	-	-	A, L, M
728030	1	2-20 µl	0.02	20 10 2	0.90 % 1.20 % 3.00 %	0.40 % 1.00 % 2.00 %	721014	-	C, N
728050	1	10-100 µl	0.10	100 50 10	0.80 % 1.00 % 2.00 %	0.15 % 0.40 % 1.00 %	721008	721018	C, D, O, V
728060	1	20-200 µl	0.20	200 100 20	0.60 % 0.80 % 2.00 %	0.15 % 0.30 % 0.80 %	721007	721017	C, D, P, Q
728070	1	100-1000 µl	1.00	1000 500 100	0.60 % 0.60 % 1.00 %	0.20 % 0.20 % 0.40 %	721006	721016	E, G, S
728080	1	500-5000 µl	10.0	5000 2500 500	0.50 % 0.60 % 2.00 %	0.20 % 0.30 % 0.60 %	721005	721015	J
728090	1	1-10 ml	20.0	10000 5000 2000	0.60 % 1.20 % 3.00 %	0.20 % 0.30 % 0.60 %	721005	721015	U

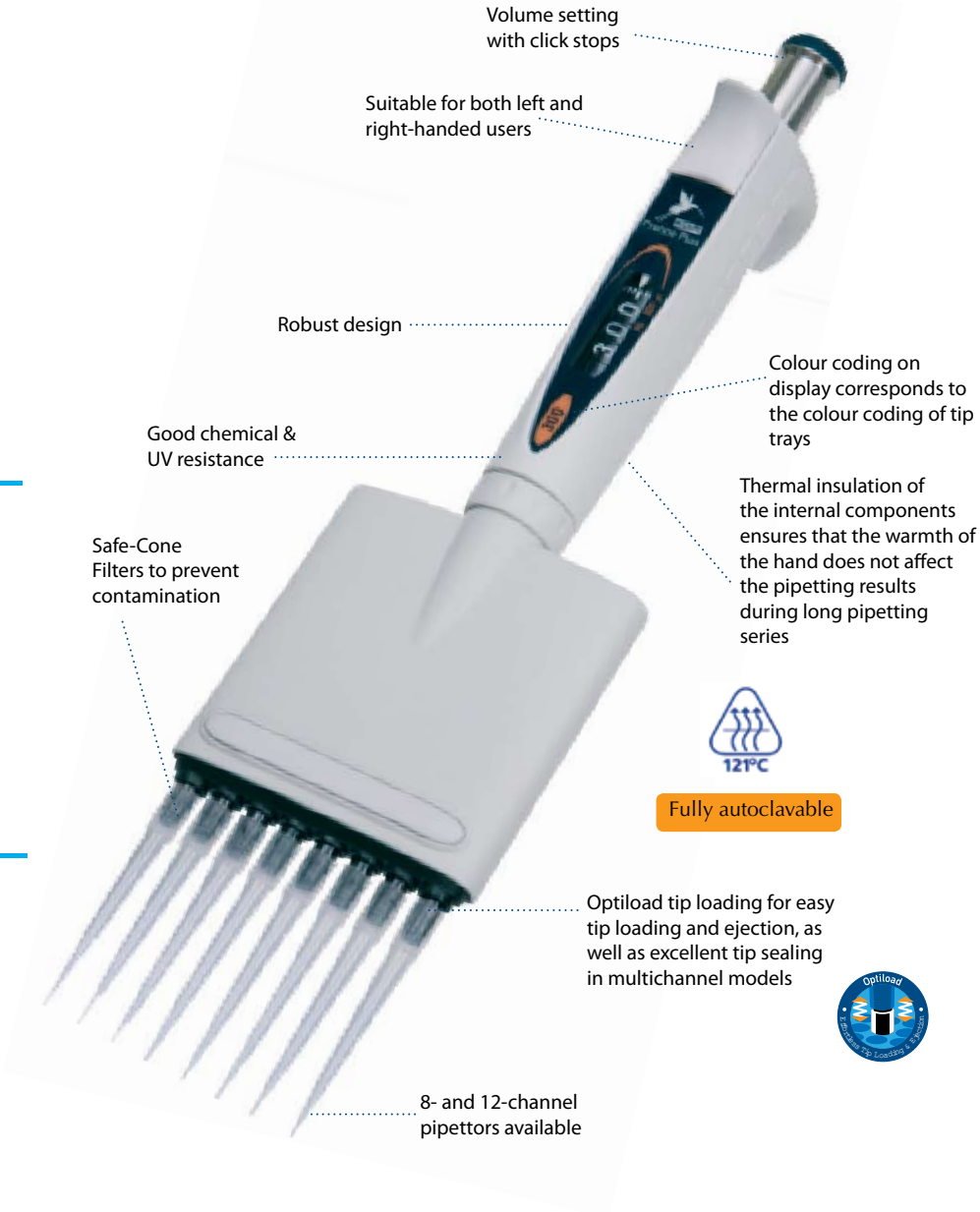
FINAS Accredited Calibration Certificate (ISO 17025) available for new pipettors – see page 65 for details

The specifications are type test specifications achieved under strictly controlled conditions (ISO 8655). Due to Biohit's continuous R&D, specifications may change without prior notice.

Optiload tip loading and perfect tip sealing

All Proline Plus multichannel pipettors are equipped with unique spring loaded tip cones – the Optiload mechanism that:

- Allows tips to be loaded with constant force
- Enables even and safe tip sealing to the tip cones with minimum force
- Makes tip ejection light and easy
- Is an advantage in multichannel models, where even tip sealing is essential


Volume setting with click stops
Suitable for both left and right-handed users
Robust design
Colour coding on display corresponds to the colour coding of tip trays
Good chemical & UV resistance
Thermal insulation of the internal components ensures that the warmth of the hand does not affect the pipetting results during long pipetting series
Safe-Cone Filters to prevent contamination
121°C
Fully autoclavable
Optiload tip loading for easy tip loading and ejection, as well as excellent tip sealing in multichannel models
Optiload
8- and 12-channel pipettors available

Proline Plus Multichannel Performance specifications and ordering details

Cat. No.	Channels	Volume range(µl)	Increment (µl)	Test volume (µl)	Inacc. (%)	Impr (%)	Safe-cone filters Standard	Safe-cone filters Plus	Tip ID
728120	8	0.5-10 µl	0.01	10 5 1	1.50 % 2.50 % 4.00 %	1.00 % 2.50 % 4.00 %	-	-	A, L, M
728130	8	10-100 µl	0.10	100 50 10	0.70 % 1.00 % 3.00 %	0.25 % 0.70 % 1.50 %	721008	721018	C, D, O, V
728140	8	30-300 µl	0.20	300 150 30	0.60 % 1.00 % 2.00 %	0.25 % 0.50 % 1.00 %	721007	721017	D, Q
728220	12	0.5-10 µl	0.01	10 5 1	1.50 % 2.50 % 4.00 %	1.00 % 2.50 % 4.00 %	-	-	A, L, M
728230	12	10-100 µl	0.10	100 50 10	0.70 % 1.00 % 3.00 %	0.25 % 0.70 % 1.50 %	721008	721018	C, D, O, V
728240	12	30-300 µl	0.20	300 150 30	0.60 % 1.00 % 2.00 %	0.25 % 0.50 % 1.00 %	721007	721017	D, Q

The specifications are type test specifications achieved under strictly controlled conditions (ISO 8655). Due to Biohit's continuous R&D, specifications may change without prior notice.

Proline® Plus Mechanical Multichannel Pipettors • Proline® Plus Single-Channel FIXED Volume Pipettors

The slim tip cone design fits also narrow laboratory tubes.

Colour coding on display corresponds to the colour coding of tip trays

A wide range of fixed volume models available

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121°C

Fully autoclavable

Proline Plus Single-Channel FIXED Volume Performance specifications and ordering details

Cat. No.	Channels	Volume range (µl)	Increment (µl)	Test volume (µl)	Inacc. (%)	Impr. (%)	Safe-cone filters Standard	Plus	Tip ID
728515	1	5 µl	-	5	1.30 %	1.20 %	-	-	A, L, M
728520	1	10 µl	-	10	0.80 %	0.80 %	-	-	A, L, M
728530	1	20 µl	-	20	0.60 %	0.50 %	721014	-	C, N
728535	1	25 µl	-	25	0.50 %	0.30 %	721008	721018	C, O, V
728545	1	50 µl	-	50	0.50 %	0.30 %	721008	721018	C, O, V
728550	1	100 µl	-	100	0.50 %	0.30 %	721008	721018	C, D, O, V
728560	1	200 µl	-	200	0.40 %	0.20 %	721007	721017	C, D, P, Q
728565	1	250 µl	-	250	0.40 %	0.20 %	721006	721016	E, G, R, S
728567	1	500 µl	-	500	0.30 %	0.20 %	721006	721016	E, G, R, S
728570	1	1000 µl	-	1000	0.30 %	0.20 %	721006	721016	E, G, S
728575	1	2000 µl	-	2000	0.30 %	0.15 %	721005	721015	J
728580	1	5000 µl	-	5000	0.30 %	0.15 %	721005	721015	J
728590	1	10 ml	-	10000	0.60 %	0.20 %	721005	721015	U

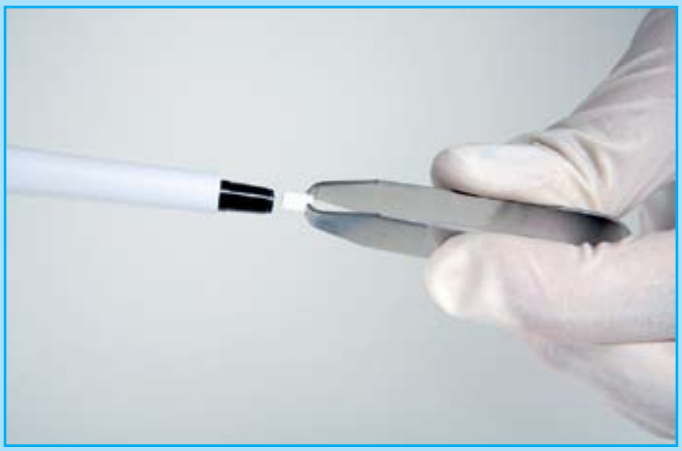
The specifications are type test specifications achieved under strictly controlled conditions (ISO 8655). Due to Biohit's continuous R&D, specifications may change without prior notice.

The Proline Plus pipettor should be stored in an upright position.
There are several different stand options:

- Carousel stand for six pipettors
- Stylish linear stand that allows the pipettor to be placed on both sides of the stand
- A handy holder that is available as an accessory

Stands

Cat. No.	Item
725600	Biohit Carousel Stand for 6 pipettors
725610	Biohit Pipettor Holder for one Proline Plus/mLINE pipettor
725620	Linear Stand for all Biohit pipettors



Prevent contamination with Safe-Cone Filters

Proline Plus features unique Safe-Cone Filters that:

- Prevent fluids and liquid vapours from reaching the internal components of the pipettor
- Help you prevent contamination of your pipettor and sample in your everyday work
- Prolong the pipettor life-time
- Are replaceable
- Can be removed by using convenient forceps
- Are available for all models > 10 µl

Basic calibration and maintenance made easy

- No opening tools are needed
- Only 3 parts need to be cleaned – piston, tip cone and tip ejector collar
- Calibration is easy with the tool included in the package
- Should you wish to leave it to a professional, Biohit offers complete maintenance, repair and calibration services

Proline Plus Starter Kit

Biohit Proline Plus Starter Kit offers an opportunity to test and get started with Proline Plus. You can choose between four Starter Kits with two or three single-channel Proline Plus pipettors. All of the kits include many useful accessories such as a pipettor holder, and a calibration tool, which also acts as a tube opener, as well as literature.

Biohit Proline Plus Starter Kit 1 - Cat. No. 728650	
• Proline Plus 0.1 - 3 µl • Proline Plus 0.5 -10 µl • Pipettor Holder x 2	• 2 single-tray tip boxes • Calibration Tool/Tube Opener • Literature

Biohit Proline Plus Starter Kit 2 - Cat. No. 728651	
• Proline Plus 0.5 - 10 µl • Proline Plus 10 - 100 µl • Proline Plus 100-1000 µl • Pipettor Holder x 3	• 3 single-tray tip boxes • Calibration Tool/Tube Opener • Literature

Biohit Proline Plus Starter Kit 3 - Cat. No. 728652	
• Proline Plus 2 - 20 µl • Proline Plus 20 - 200 µl • Proline Plus 100 - 1000 µl • Pipettor Holder x 3	• 3 single-tray tip boxes • Calibration Tool/Tube Opener • Literature

Biohit Proline Plus Starter Kit 4 - Cat. No. 728653	
• Proline Plus 500-5000 µl • Proline Plus 1000-10 000 µl • Pipettor Holder x 2	• 2 bulk tip boxes • Calibration Tool/Tube Opener • Literature

BIOHIT
Innovating for Health

Proline®

3 YEARS WARRANTY

ERGONOMICALLY DESIGNED

CE

IVD

Made in Finland

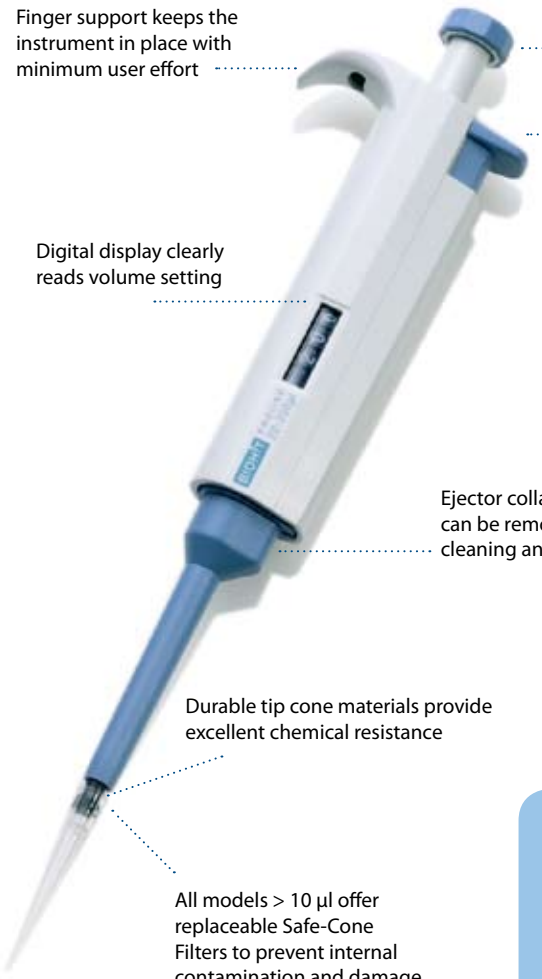
The original Biohit mechanical pipettor – Proline®

More than 15 years in the top of the world of pipettors. In that time Proline pipettors have become a synonym for high quality. Working with Proline, you will get many years of reliable service. The Proline pipettors cover the volume range 0.1 µl to 5000 µl with 8 different adjustable single-channel and 8 adjustable multichannel models. Proline is also available in fixed volume single-channel models.

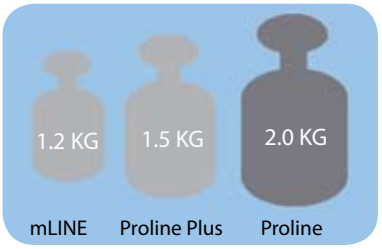
Proline - a good basic pipettor

- Designed for many different types of routine laboratory work
- Lightweight design
- Good accuracy and precision
- Volume setting by click stops
- Full documentation, warranties and certificates
- Safe-Cone Filters to prevent internal contamination and damage

Tips on pages 52-53
Filters on page 56
Pipettor selection guide on page 76
Ergonomics on page 72


Finger support keeps the instrument in place with minimum user effort
Volume setting by click stops
Tip ejector allows convenient one-handed operation
Digital display clearly reads volume setting
Ejector collar and tip cone can be removed for easy cleaning and maintenance
Durable tip cone materials provide excellent chemical resistance
All models > 10 µl offer replaceable Safe-Cone Filters to prevent internal contamination and damage

What's the difference?



Comparison of the pipetting forces needed. See page 76 for selection guide.

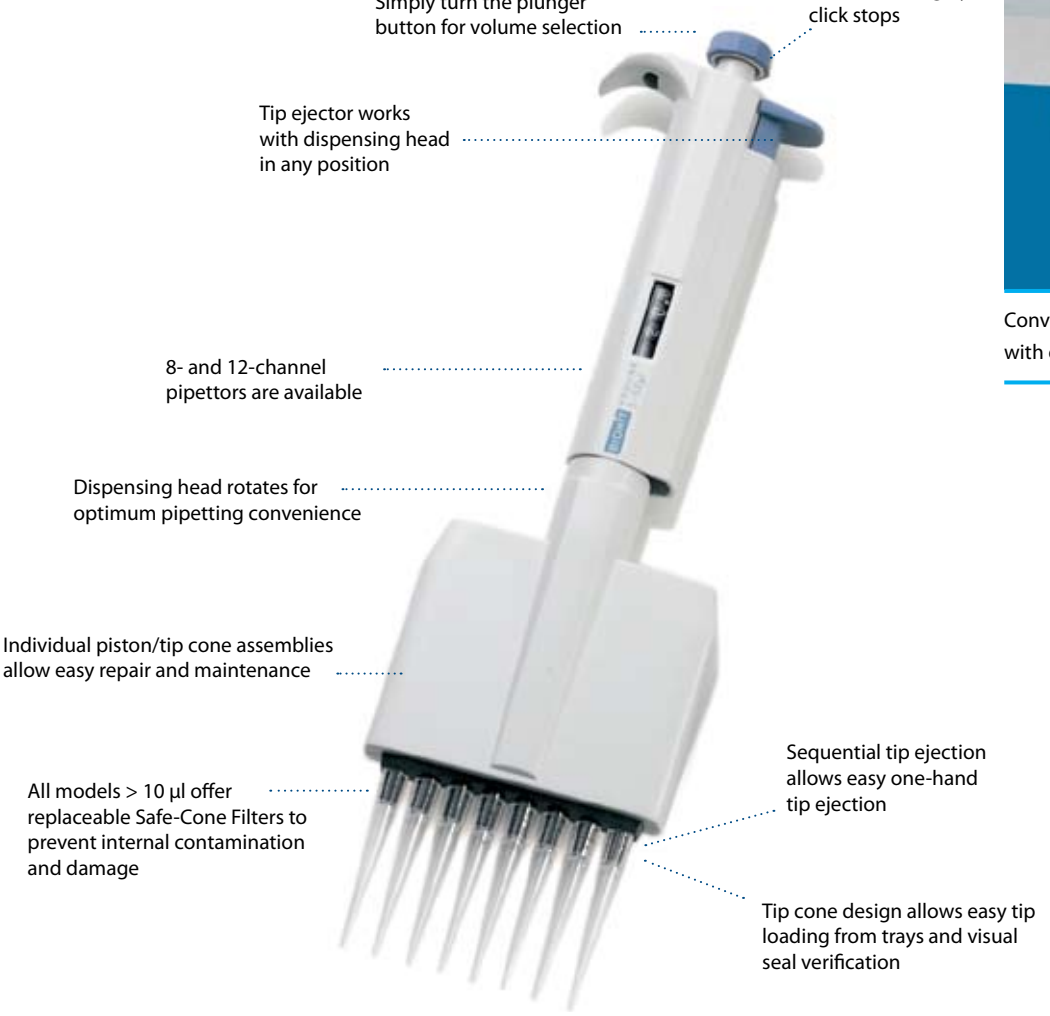
Proline Single-Channel Performance specifications and ordering details

Cat. No.	Channels	Volume Range (µl)	Increment (µl)	Test Volume (µl)	Inacc. (%)	Impr. (%)	Safe-Cone Filters Standard	Plus	Tip ID
720005	1	0.1-2.5 µl	0.05	2.5 1.25 0.25	2.50 % 3.00 % 12.00 %	2.00 % 3.00 % 6.00 %	-	-	A, L, M
720000	1	0.5-10 µl	0.10	10 5 1	1.00 % 1.50 % 2.50 %	0.80 % 1.50 % 1.50 %	-	-	A, C, L, M, N
720080	1	2-20 µl	0.50	20 10 2	0.90 % 1.20 % 3.00 %	0.40 % 1.00 % 2.00 %	721008	721018	C, N, O
720020	1	5-50 µl	0.50	50 25 5	0.60 % 0.90 % 2.00 %	0.30 % 0.60 % 2.00 %	721008	721018	C, D, O
720050	1	10-100 µl	1.00	100 50 10	0.80 % 1.00 % 3.00 %	0.20 % 0.40 % 1.00 %	721007	721017	C, D, O, V, P, Q
720070	1	20-200 µl	1.00	200 100 20	0.60 % 0.80 % 2.50 %	0.20 % 0.30 % 0.80 %	721007	721017	C, D, P, Q
720060	1	100-1000 µl	5.00	1000 500 100	0.60 % 0.70 % 2.00 %	0.20 % 0.25 % 0.70 %	721006	721016	E, G, S
720110	1	1000-5000 µl	50.0	5000 2500 1000	0.50 % 0.60 % 0.70 %	0.20 % 0.30 % 0.30 %	721005	721015	J

FINAS Accredited Calibration Certificate (ISO 17025) available for new pipettors – see page 65 for details

The specifications are type test specifications achieved under strictly controlled conditions (ISO 8655). Due to Biohit's continuous R&D, specifications may change without prior notice.

Convenient pipettor holder included with each pipettor


Simply turn the plunger button for volume selection
Volume setting by click stops
Tip ejector works with dispensing head in any position
8- and 12-channel pipettors are available
Dispensing head rotates for optimum pipetting convenience
Individual piston/tip cone assemblies allow easy repair and maintenance
All models > 10 µl offer replaceable Safe-Cone Filters to prevent internal contamination and damage
Sequential tip ejection allows easy one-hand tip ejection
Tip cone design allows easy tip loading from trays and visual seal verification

Tips on pages 52-53
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Pipettor selection guide on page 72
Ergonomics on page 81

Proline Multichannel Performance specifications and ordering details

Cat. No.	Channels	Volume Range (µl)	Increment (µl)	Test Volume (µl)	Inacc. (%)	Impr. (%)	Safe-Cone Filters Standard	Safe-Cone Filters Plus	Tip ID
720210	8-channel	0.5-10 µl	0.10	10 5 1	1.50 % 2.50 % 4.00 %	1.50 % 2.50 % 4.00 %	-	-	A, L, M
720220	8-channel	5-50 µl	0.50	50 25 5	1.00 % 1.50 % 3.00 %	0.50 % 1.00 % 2.00 %	721014	-	C, D, O, V, P, Q
720240	8-channel	50-300 µl	5.00	300 150 50	0.70 % 1.00 % 1.50 %	0.25 % 0.50 % 0.80 %	721014	-	D, Q
720310	12-channel	0.5-10 µl	0.10	10 5 1	1.50 % 2.50 % 4.00 %	1.50 % 2.50 % 4.00 %	-	-	A, L, M
720320	12-channel	5-50 µl	0.50	50 25 5	1.00 % 1.50 % 3.00 %	0.50 % 1.00 % 2.00 %	721014	-	C, D, O, V, P, Q
720340	12-channel	50-300 µl	5.00	300 150 50	0.70 % 1.00 % 1.50 %	0.25 % 0.50 % 0.80 %	721014	-	D, Q

The specifications are type test specifications achieved under strictly controlled conditions (ISO 8655). Due to Biohit's continuous R&D, specifications may change without prior notice.

Proline carousel stand for 5 pipettors

Fixed volume pipettor has white display to differentiate it from adjustable volume Proline pipettors

See Proline features on pages 19–20

Stands & Accessories

Cat. No.	Item
721000	Proline Carousel Stand for 5 mechanical pipettors
725620	Linear Stand
721259	Proline Pipettor Holder for 1 pipettor
721234	Colour coding caps, 6 pcs

Tips on pages 52-53
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Proline Single-Channel FIXED Volume Performance specifications and ordering details

Cat. No.	Channels	Volume Range (µl)	Increment (µl)	Test Volume (µl)	Inacc. (%)	Impr. (%)	Safe-Cone Filters Standard	Plus	Tip ID
722001	1-channel	5 µl	-	5	1.30 %	1.20 %	-	-	A, C, L, M, N
722004	1-channel	10 µl	-	10	0.80 %	0.80 %	-	-	A, C, L, M, N
722010	1-channel	20 µl	-	20	0.60 %	0.50 %	721008	721018	C, D, N, O
722015	1-channel	25 µl	-	25	0.50 %	0.30 %	721008	721018	C, D, O
722020	1-channel	50 µl	-	50	0.50 %	0.30 %	721008	721018	C, D, O
722025	1-channel	100 µl	-	100	0.50 %	0.30 %	721007	721017	C, D, O, V, P, Q
722030	1-channel	200 µl	-	200	0.40 %	0.20 %	721007	721017	C, D, P, Q
722035	1-channel	250 µl	-	250	0.40 %	0.20 %	721006	721016	E, G, R, S
722040	1-channel	500 µl	-	500	0.30 %	0.20 %	721006	721016	E, G, R, S
722045	1-channel	1000 µl	-	1000	0.30 %	0.20 %	721006	721016	E, G, S
722050	1-channel	2000 µl	-	2000	0.30 %	0.15 %	721005	721015	J
722055	1-channel	5000 µl	-	5000	0.30 %	0.15 %	721005	721015	J

FINAS Accredited Calibration Certificate (ISO 17025) available for new pipettors – see page 65 for details

The specifications are type test specifications achieved under strictly controlled conditions (ISO 8655). Due to Biohit's continuous R&D, specifications may change without prior notice.

BIOHIT
Innovating for Health

eLINE®

2 YEARS WARRANTY

ERGONOMICALLY DESIGNED

121°C

Autoclavable lower parts

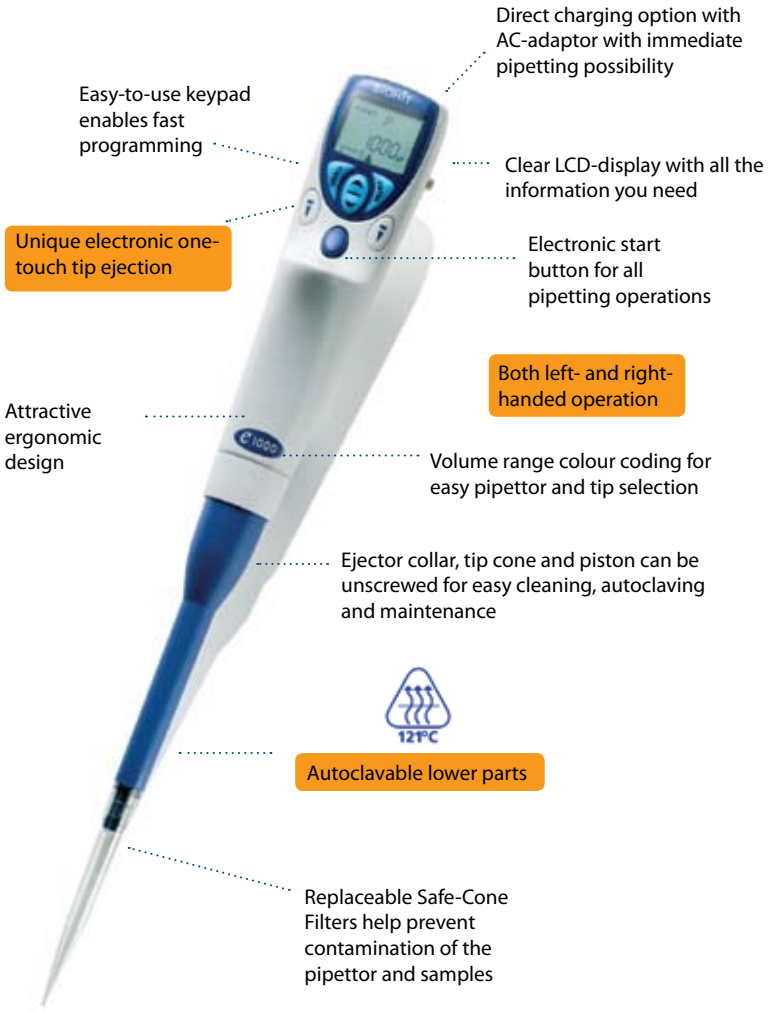
CE

IVD

Made in Finland

Leader in performance & ergonomics – eLINE®

When you need to pipette and dispense liquids as comfortably as possible, your choice should be eLINE. This honorary mentioned (Pro Finnish Design 2001) electronic pipettor takes analytical performance and ergonomic innovation to totally new levels! Its fully electronic operation – including tip ejection – gives you the chance to concentrate the work-effort to where it's needed the most. eLINE pipettors cover the full volume range of 0.2 to 5000 µl.


Direct charging option with AC-adaptor with immediate pipetting possibility
Easy-to-use keypad enables fast programming
Clear LCD-display with all the information you need
Unique electronic one-touch tip ejection
Electronic start button for all pipetting operations
Both left- and right-handed operation
Attractive ergonomic design
Volume range colour coding for easy pipettor and tip selection
Ejector collar, tip cone and piston can be unscrewed for easy cleaning, autoclaving and maintenance
121°C
Autoclavable lower parts
Replaceable Safe-Cone Filters help prevent contamination of the pipettor and samples

eLINE - leader in performance and ergonomics

- Excellent accuracy and precision with the unique DC motor concept
- Fully electronic operations guarantee user-independent results
- Makes pipetting faster and easier
- Built-in error control for more reliable results
- Easiest tip ejection ever with the unique electronic tip ejection
- Ergonomic design that suits both left- and right-handed
- You need only one pipettor instead of two – one eLINE covers the volume ranges of two mechanical pipettors
- Comprehensive range of liquid handling protocols with easy programming

Tips on pages 52-53
Filters on page 56
Pipettor selection guide on page 76
Ergonomics on page 72
Autoclaving instructions on page 81

eLINE Single-Channel Performance specifications and ordering details

Cat. No.	Channels	Volume Range (µl)	Increment (µl)	Test Volume (µl)	Inacc. (%)	Impr. (%)	Safe-Cone Filters Standard	Plus	Tip ID
73002X	1-channel	0.2-10 µl	0.05	10 5 1 0.2	0.90 % 1.00 % 2.50 % 12.00 %	0.40 % 0.70 % 1.50 % 10.00 %	-	-	A, L, M
73004X	1-channel	5-120 µl	0.50	120 60 12 5	0.40 % 0.60 % 2.00 % 3.50 %	0.15 % 0.20 % 1.00 % 1.50 %	721008	721018	C, D, V
73006X	1-channel	10-300 µl	1.00	300 150 30 10	0.40 % 0.60 % 1.50 % 3.50 %	0.15 % 0.20 % 0.80 % 2.00 %	721007	721017	D, Q *1
73008X	1-channel	50-1000 µl	5.00	1000 500 100 50	0.40 % 0.60 % 1.50 % 2.00 %	0.15 % 0.20 % 0.50 % 1.00 %	721006	721016	E, G, S
73010X	1-channel	100-5000 µl *2	10.0	5000 2500 500	0.50 % 0.80 % 1.00 %	0.15 % 0.20 % 0.40 %	721006	721016	J

FINAS Accredited Calibration Certificate (ISO 17025) available for new pipettors – see page 65 for details

X: 0 =Without AC-adaptor, 1 = With AC-adaptor, Euro; 2 = With AC-adaptor, U.S.; 3 = With AC-adaptor, U.K.; 4 = With AC-adaptor, Jpn; 5 = With AC-adaptor, Aus
*1 Note: Maximum volume 300 µl. In the d-mode the total displayed volume can not exceed 270 µl.
*2 Note: Minimum volume in P-mode is 500 µl. The 100 µl is possible in d-mode.
The specifications are type test specifications achieved under strictly controlled conditions (ISO 8655). Due to Biohit's continuous R&D, specifications may change without prior notice.

BIOHIT
Innovating for Health

Both left- and right-handed operation

Clear LCD-display informs and instructs the user during pipetting

Easy-to-use keypad enables fast programming

Unique electronic one-touch tip ejection

Volume range colour coding for easy pipettor and tip selection

Dispensing head rotates to both directions without accidental disassembling for optimum pipetting convenience

Individual piston/tip cone assemblies allow easy repair and maintenance

Optiload tip loading mechanism

Replaceable Safe-Cone Filters help prevent contamination of the pipettor and samples

121°C
Autoclavable dispensing head (excl. 1200 µl 8/12 models)

Optiload tip loading and perfect tip sealing

- Available in multichannel eLINE pipettors
- Allows tip loading with an equal constant force to every channel
- Tips are perfectly sealed to every individual tip cone
- Is an advantage in multichannel models, where tip sealing is essential

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eLINE Multichannel Performance specifications and ordering details

Cat. No.	Channels	Volume Range (µl)	Increment (µl)	Test Volume (µl)	Inacc. (%)	Impr. (%)	Safe-Cone Filters Standard	Plus	Tip ID
73032X	8-channel	0.2-10 µl	0.05	10 5 1	0.90 % 1.50 % 4.00 %	0.50 % 0.80 % 3.00 %	-	-	A, L, M
73034X	8-channel	5-120 µl	0.50	120 60 12	0.50 % 0.70 % 2.00 %	0.20 % 0.30 % 1.50 %	721008	721018	C, D, V
73036X	8-channel	10-300 µl	1.00	300 150 30	0.50 % 0.70 % 2.00 %	0.20 % 0.30 % 1.00 %	721007	721017	D, Q *[1]
73039X	8-channel	50-1200 µl	5.00	1200 600 120	0.50 % 1.00 % 2.50 %	0.20 % 0.30 % 1.00 %	721006	721016	H, T, Z
73042X	12-channel	0.2-10 µl	0.05	10 5 1	0.90 % 1.50 % 4.00 %	0.50 % 0.80 % 3.00 %	-	-	A, L, M
73044X	12-channel	5-120 µl	0.50	120 60 12	0.50 % 0.70 % 2.00 %	0.20 % 0.30 % 1.50 %	721008	721018	C, D, V
73046X	12-channel	10-300 µl	1.00	300 150 30	0.50 % 0.70 % 2.00 %	0.20 % 0.30 % 1.00 %	721007	721017	D, Q *[1]
73049X	12-channel	50-1200 µl	5.00	1200 600 120	0.50 % 1.00 % 2.50 %	0.20 % 0.30 % 1.00 %	721006	721016	H, T, Z

X: 0 =Without AC-adaptor, 1 = With AC-adaptor, Euro; 2 = With AC-adaptor, U.S.; 3 = With AC-adaptor, U.K.; 4 = With AC-adaptor, Jpn; 5 = With AC-adaptor, Aus
*[1] Note: Maximum volume 300 ul. In the d-mode the total displayed column can not exceed 270 ul.
The specifications are type test specifications achieved under strictly controlled conditions (ISO 8655). Due to Biohit's continuous R&D, specifications may change without prior notice.

eLINE charging options

- 1-Place Charging Stand
- 4-Place Charging Carousel
- AC-adaptor

The eLINE electronic pipettors can be charged with a 1-place charging stand, a 4-place charging carousel or a direct charging AC-adaptor. The variety of charging options has been designed for optimal utility and all charging options are delivered with the AC-adaptor of choice. It is possible to continue pipetting while the eLINE is charged through the AC-adaptor. The compact design of the 4-pipettor charging carousel is ideal for saving bench space in the laboratory and allows the pipettor to be rested between dispensing routines with a tip attached. The 4-place rotating head provides easy access to the desired unit.

eLINE operation modes

- Pipetting
- Reverse Pipetting
- Pipetting with Mixing
- Pipetting with Cycle Counter
- Manual Pipetting *1
- Multiple Dispensing
- Diluting
- Diluting with Mixing
- Sequential Dispensing
- Multi-Aspirating
- Automatic Multiple Dispensing
- 6 memory places for your favourite pipetting protocols
- 9 speeds for aspiration and dispensing

For pipetting modes, please go to page 77.

*1 Note: Not available in eLINE multichannel models.

Direct charging feature allows pipetting while charging

Cat. No.	Item
73098X	eLINE Charging Stand for one pipettor, with AC-adaptor
73099X	eLINE Charging Carousel for 4 pipettors, with AC-adaptor
725620	Linear Stand
731001	eLINE Replacement Battery

X: 1 = With AC-adaptor, Euro; 2 = With AC-adaptor, U.S.; 3 = With AC-adaptor, U.K.; 4 = With AC-adaptor, Jpn; 5 = With AC-adaptor, Aus

"eLINE is the perfect pipettor taking care of both the work and the person using it"

Lisbeth Lemmetti, Development Analyst, Biomedicine Blood Centre at Sahlgrenska University Hospital, Sweden

Unique one-touch electronic tip ejection

Tip ejection can be laborious and at worst a contributing factor to Repetitive Strain Injury (RSI). With the eLINE this is no longer the case, as the unique electronic tip ejection system allows tip removal at the light touch of a button.

The eLINE is the only pipettor in the market that offers electronic tip ejection. This feature has been designed for both left- and right-handed operation.

Patented Biohit DC-motor concept

The patented and unique Biohit concept includes the DC-motor, solenoid brake and error control.

Improved accuracy and precision

The solenoid brake of the eLINE enables over 10 times more precise positioning of the piston compared to a stepper motor driven system. This is a major advantage in multi-dispensing mode where liquid column has to be cut sharply to have even doses. This means superior accuracy and precision.

Built-in error control for more reliable results

Even the best pipettor may occasionally make errors. Important is to be able to notice them. Biohit electronic pipettors feature a built-in error control. The pipettor controls and monitors the piston movement in real time. If an error occurs while pipetting, the pipettor notifies the user, thus allowing for more reliable results.

BIOHIT
Innovating for Health

Proline®

The original electronic for all pipetting needs

In 1991 Biohit introduced its first electronic pipettors. Since then, Biohit Proline electronic pipettors have offered effortless and rapid pipetting with high levels of accuracy and precision. Some say that the Proline range offers complete solutions for all pipetting needs. Yes, we think that too. Proline pipettors are ergonomically designed and the tip ejection is easily operated with four fingers to avoid strain and fatigue during pipetting. Proline electronic is available in single- and multichannel models, covering the volume range 0.2 – 5000 µl.

Proline electronic – for all pipetting needs

- Lightweight ergonomic design
- Single-point calibration
- 5 speeds for aspiration and dispensing
- Wide volume range
- Design that helps prevent Repetitive Strain Injury (RSI)
- Option of single- or 4-place carousel charging stands (either needed for operation)
- Comprehensive range of the most important liquid handling protocols

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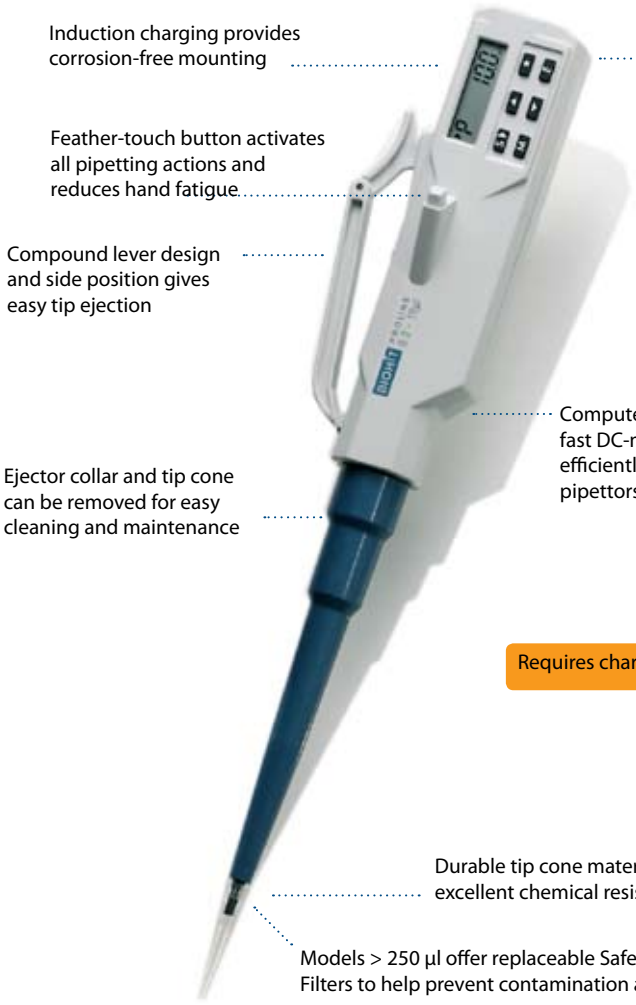
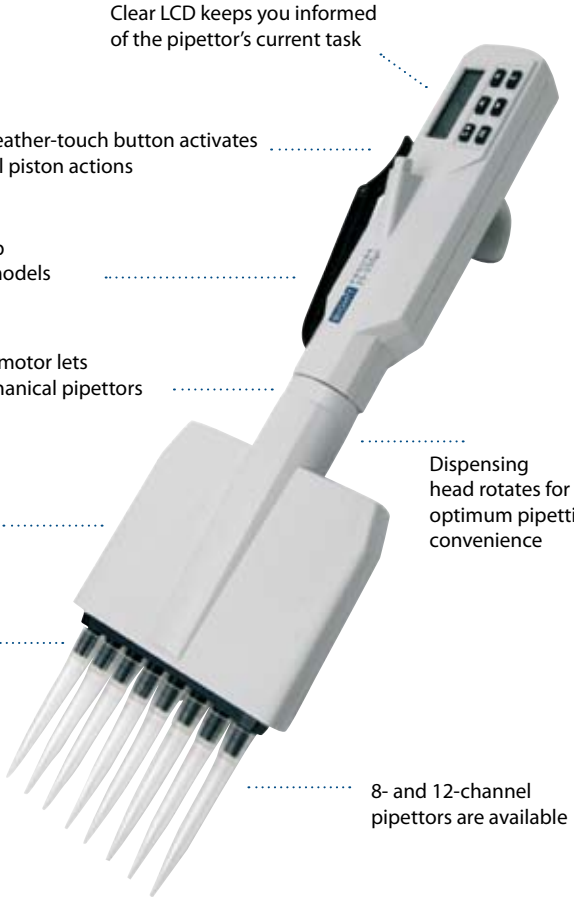

Induction charging provides corrosion-free mounting
Simple keypad allows easy, error-free selection of liquid handling modes, volumes and speeds
Feather-touch button activates all pipetting actions and reduces hand fatigue
Compound lever design and side position gives easy tip ejection
Computerized drive system with fast DC-motor lets you work more efficiently than with mechanical pipettors
Ejector collar and tip cone can be removed for easy cleaning and maintenance
Requires charging stand
Durable tip cone materials provide excellent chemical resistance
Models > 250 µl offer replaceable Safe-Cone Filters to help prevent contamination and damage

Proline Single-Channel Performance specifications and ordering details

Cat. No.	Channels	Volume Range (µl)	Increment (µl)	Test Volume (µl)	Inacc. (%)	Impr. (%)	Safe-Cone Filters Standard	Plus	Tip ID
710520	1-channel	0.2-10 µl	0.10	10 5 1 0.2	0.90 % 1.00 % 2.50 % 12.00 %	0.50 % 0.80 % 1.80 % 10.00 %	-	-	A, L, M
710010	1-channel	5-100 µl	1.00	100 50 10 5	0.40 % 0.70 % 2.00 % 2.50 %	0.15 % 0.30 % 1.00 % 1.80 %	-	-	C, O, V
710030	1-channel	10-250 µl	5.00	250 125 25 10	0.40 % 0.60 % 2.00 % 2.00 %	0.15 % 0.20 % 1.00 % 1.00 %	-	-	C, D, Q
710100	1-channel	10-500 µl	5.00	500 250 50 10	0.40 % 0.70 % 1.50 % 9.00 %	0.15 % 0.20 % 0.80 % 2.00 %	721006	721016	E, G, R
710020	1-channel	50-1000 µl	10.0	1000 500 100 50	0.60 % 0.80 % 2.00 % 2.00 %	0.15 % 0.20 % 0.60 % 1.00 %	721006	721016	E, G, S
710040	1-channel	50-1200 µl	5.00	1200 600 120 50	0.40 % 0.70 % 2.00 % 2.00 %	0.15 % 0.20 % 0.60 % 1.00 %	721006	721016	H, T, Z
710500	1-channel	100-5000 µl *1	50.0	5000 2500 500	0.50 % 0.80 % 0.80 %	0.15 % 0.25 % 0.60 %	721006	721016	J

FINAS Accredited Calibration Certificate (ISO 17025) available for new pipettors – see page 65 for details

The specifications are type test specifications achieved under strictly controlled conditions (ISO 8655). Due to Biohit's continuous R&D, specifications may change without prior notice.
*1 Note: Minimum volume in P-mode is 500 µl. The 100 µl is possible in d-mode.
Note: Proline electronic pipettor needs a charging stand for operation.


Clear LCD keeps you informed of the pipettor's current task
Feather-touch button activates all piston actions
Tip ejector allows effortless tip ejection even in 12-channel models
Computerized drive system with fast DC-motor lets you work more efficiently than with mechanical pipettors
Dispensing head rotates for optimum pipetting convenience
Individual piston/tip cone assemblies allow easy repair and maintenance
Models > 10 µl have replaceable Safe-Cone Filters to help prevent contamination and damage
8- and 12-channel pipettors are available

Requires charging stand

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Proline Multichannel Performance specifications and ordering details

Cat. No.	Channels	Volume Range (µl)	Increment (µl)	Test Volume (µl)	Inacc. (%)	Impr. (%)	Safe-Cone filters Standard	Safe-Cone filters Plus	Tip ID
710200	8-channel	0.2-10 µl	0.10	10 5 1	0.90 % 1.50 % 4.00 %	0.50 % 0.80 % 4.00 %	-	-	A, L, M
710210	8-channel	5-100 µl	1.00	100 50 10 5	0.50 % 0.70 % 2.50 % 4.00 %	0.20 % 0.30 % 1.50 % 2.50 %	721014	-	C, D, O, P, Q, V
710220	8-channel	25-250 µl	5.00	250 125 25	0.40 % 0.60 % 1.50 %	0.15 % 0.20 % 1.00 %	721014	-	D, Q
710800	8-channel	50-1200 µl	10.0	1200 600 120 50	0.50 % 1.00 % 3.00 % 8.00 %	0.15 % 0.20 % 1.20 % 1.50 %	721006	721016	H, T, Z
710300	12-channel	0.2-10 µl	0.10	10 5 1	0.90 % 1.50 % 4.00 %	0.50 % 0.80 % 4.00 %	-	-	A, L, M
710310	12-channel	5-100 µl	1.00	100 50 10 5	0.50 % 0.80 % 2.50 % 4.00 %	0.20 % 0.40 % 1.50 % 2.50 %	721014	-	C, D, O, P, Q, V
710320	12-channel	25-250 µl	5.00	250 125 25	0.40 % 0.60 % 1.50 %	0.15 % 0.20 % 1.00 %	721014	-	D, Q
710810	12-channel	50-1200 µl	10.0	1200 600 120 50	0.80 % 1.00 % 3.00 % 8.00 %	0.15 % 0.20 % 1.20 % 1.50 %	721006	721016	H, T, Z

The specifications are type test specifications achieved under strictly controlled conditions (ISO 8655). Due to Biohit's continuous R&D, specifications may change without prior notice.
Note: Proline electronic pipettor needs a charging stand for operation.

Stands & Accessories

Cat. No.	Item
51000X	Proline Charging Stand for one pipettor
51160X	Proline Charging Carousel for 4 pipettors
711002	Proline Replacement Battery

X: 1 = AC-adaptor, Euro; 2 = AC-adaptor, U.S.;
3 = AC-adaptor, U.K.; 4 = AC-adaptor, Jpn

Proline charging options

- 1-Place Charging Stand
- 4-Place Charging Carousel

The Proline electronic pipettors can be charged with a 1-place charging stand or a 4-place charging carousel.
The compact design of the 4-place charging carousel is ideal for saving bench space in the laboratory and allows the pipettor to be rested between dispensing routines. The 4-place rotating head provides easy access to the desired unit.

Proline operation modes

- Pipetting
- Pipetting with mixing
- Reverse Pipetting (excl. 1200 and 5000 models)
- Multiple Dispensing
- Diluting (excl. multichannel 1200 model)
- Diluting with mixing (excl. multichannel 1200 model)
- Sequential Dispensing (only 1200 and 5000 models)
- Multi-Aspirating (only 1200 models)

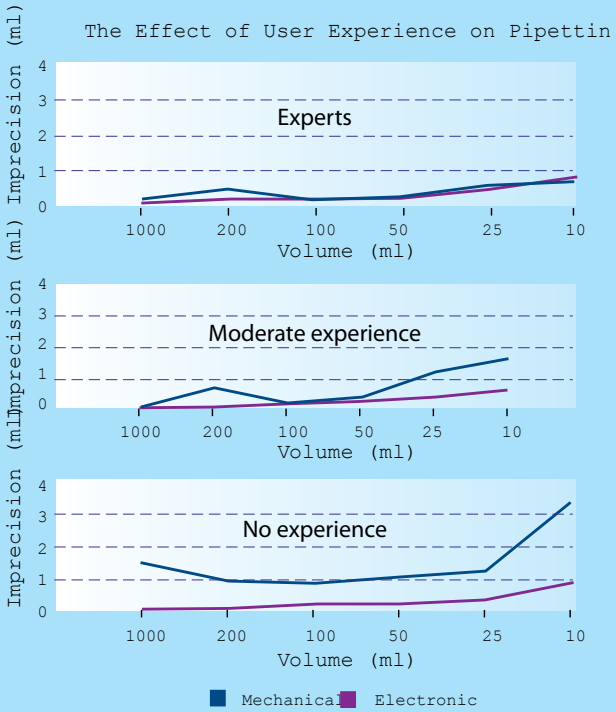
For pipetting modes, please go to page 77.

User-independent accuracy with Biohit electronic pipettors

Whilst experience and good pipetting practice are essential for reproducible results with mechanical pipettors, the electronic pipettors produce precise results independent of user experience.

Proline, like all other Biohit's electronic pipettors, features the patented DC-motor concept, which enables more precise and smooth piston movement compared to mechanical pipetting. This means superior accuracy and precision, in all pipetting actions. Results are always reproducible even with small volumes independent on experience, as hand control is totally eliminated.

Nine persons were divided into three groups according to their experience in pipetting. Each person pipetted distilled water with the same Biohit Proline mechanical and electronic pipettors (using P-mode). The imprecision of ten subsequent results of volumes 10, 25, 50, 100, 200 and 1000 µl was recorded and the results are detailed in pictures on the right.



BIOHIT
Innovating for Health

The compact and economical alternative – ePET®

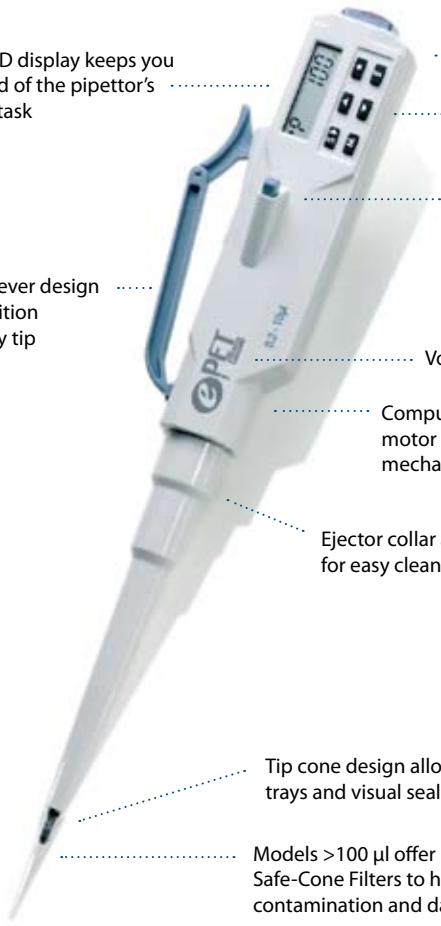
Biohit ePET electronic pipettors offer an easy and affordable access to electronic pipetting. By using a direct charging system which requires no charging stand, ePET is a very cost-effective choice for electronic pipetting! The ePET is available in single-channel models covering the volume range of 0.2 to 5000 µl and multichannel models for 0.2 to 1200 µl.

ePET – compact and economical

- Pipetting
- Pipetting with Mixing
- Multi Dispensing
- Diluting
- Diluting with Mixing
- 5 speeds for aspirating and dispensing

Direct charging makes the ePET a cost-effective alternative for electronic pipetting

Requires no charging stand


Clear LCD display keeps you informed of the pipettor's current task
Direct charging using AC-adaptor
Simple keypad allows easy, error free selection of liquid handling modes, volumes and speeds
Feather-touch button activates all piston actions
Compound lever design and side position provides easy tip ejection
Volume range colour coding
Computerized drive system with fast DC-motor lets you work more efficiently than with mechanical pipettors
Ejector collar and tip cone can be removed for easy cleaning and maintenance
Tip cone design allows easy tip mounting from trays and visual seal verification
Models >100 µl offer replaceable Safe-Cone Filters to help prevent contamination and damage

Tips on pages 52-53
Filters on page 56
Pipettor selection guide on page 76
Ergonomics on page 72

Stands & Accessories

Cat. No.	Item
710999	ePET Stand for one pipettor
725620	Linear Stand
711002	ePET Replacement Battery

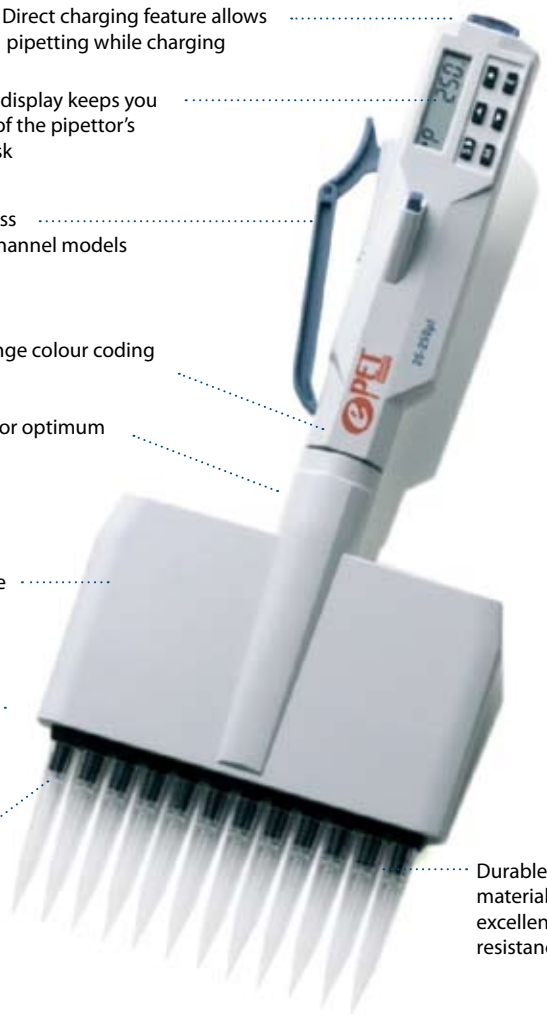
ePET Single-Channel Performance specifications and ordering details

Cat. No.	Channels	Volume Range (µl)	Increment (µl)	Test Volume (µl)	Inacc. (%)	Impr. (%)	Safe-Cone Filters Standard	Plus	Tip ID
71052XET	1-channel	0.2-10 µl	0.10	10 5 1 0.2	0.90 % 1.00 % 2.50 % 12.00 %	0.50 % 0.80 % 1.80 % 10.00 %	-	-	A, L, M
71001XET	1-channel	5-100 µl	1.00	100 50 10 5	0.40 % 0.70 % 2.00 % 2.50 %	0.15 % 0.30 % 1.00 % 1.80 %	-	-	C, O, V
71002XET	1-channel	50-1000 µl	5.00	1000 500 100 50	0.40 % 0.70 % 1.50 % 2.00 %	0.15 % 0.20 % 0.50 % 1.00 %	721006	721016	E, G, S
71004XET	1-channel	50-1200 µl	5.00	1200 600 120 50	0.40 % 0.70 % 2.00 % 2.00 %	0.15 % 0.20 % 0.60 % 1.00 %	721006	721016	H, T, Z
71050XET	1-channel	100-5000 µl *1	50.0	5000 2500 500	0.50 % 0.80 % 0.80 %	0.15 % 0.20 % 0.30 %	721006	721016	J

FINAS Accredited Calibration Certificate (ISO 17025) available for new pipettors – see page 65 for details

X: 1 = AC-adaptor, Euro; 2 = AC-adaptor, U.S.; 3 = AC-adaptor, U.K.; 4 = AC-adaptor, Jpn
The specifications are type test specifications achieved under strictly controlled conditions (ISO 8655). Due to Biohit's continuous R&D, specifications may change without prior notice.
*1 Note: Minimum volume in P-mode is 500 µl. The 100 µl is possible in d-mode.

ePET® Electronic Multichannel Pipettors


Direct charging feature allows pipetting while charging
Clear LCD-display keeps you informed of the pipettor's current task
Tip ejector allows effortless tip ejection even on 12-channel models
Volume range colour coding
Dispensing head rotates for optimum pipetting convenience
8- and 12-channel pipettors are available
Individual piston/tip cone assemblies allow easy repair and maintenance
Safe-Cone Filters for models > 10 µl
Durable tip cone materials provide excellent chemical resistance

ePET multichannel pipettor family

Requires no charging stand

Tips on pages 52-53
Filters on page 56
Pipettor selection guide on page 76
Ergonomics on page 72

ePET Multichannel Performance specifications and ordering details

Cat. No.	Channels	Volume Range (µl)	Increment (µl)	Test Volume (µl)	Inacc. (%)	Impr. (%)	Safe-Cone filters Standard	Plus	Tip ID
71020XET	8-channel	0.2-10 µl	0.10	10 5 1	0.90 % 1.50 % 4.00 %	0.50 % 0.80 % 4.00 %	-	-	A, L, M
71021XET	8-channel	5-100 µl	1.00	100 50 10 5	0.50 % 0.70 % 2.50 % 4.00 %	0.20 % 0.30 % 1.50 % 2.50 %	721014	-	C, D, O, P, Q, V
71022XET	8-channel	25-250 µl	5.00	250 125 25	0.40 % 0.60 % 1.50 %	0.15 % 0.20 % 1.00 %	721014	-	D, Q
71080XET	8-channel	50-1200 µl	10.0	1200 600 120 50	0.50 % 1.00 % 3.00 % 8.00 %	0.15 % 0.20 % 1,20 % 1.50 %	721006	721016	H, T, Z
71030XET	12-channel	0.2-10 µl	0.10	10 5 1	0.90 % 1.50 % 4.00 %	0.50 % 0.80 % 4.00 %	-	-	A, L, M
71031XET	12-channel	5-100 µl	1.00	100 50 10 5	0.50 % 0.80 % 2.50 % 4.00 %	0.20 % 0.40 % 1.50 % 2.50 %	721014	-	C, D, O, P, Q, V
71032XET	12-channel	25-250 µl	5.00	250 125 25	0.40 % 0.60 % 1.50 %	0.15 % 0.20 % 1.00 %	721014	-	D, Q
71081XET	12-channel	50-1200 µl	10.0	1200 600 120 50	0.80 % 1.00 % 3.00 % 8.00 %	0.15 % 0.20 % 1.20 % 1.50 %	721006	721016	H, T, Z

X: 1 = AC-adaptor, Euro; 2 = AC-adaptor, U.S.; 3 = AC-adaptor, U.K.; 4 = AC-adaptor, Jpn
The specifications are type test specifications achieved under strictly controlled conditions (ISO 8655). Due to Biohit's continuous R&D, specifications may change without prior notice.

5ml
4

BIOHIT
Innovating for Health

eLINE®

A single innovation makes all the difference

eLINE Dispenser hands you the most convenient and ergonomic approach to multiple dispensing. The automated liquid handling operation offers accurate and repetitive dispensing also with viscous, infectuous and high vapour pressure liquids. The unique TipGuide selects and displays the most suitable tip size which saves time and eliminates the possibility of an incorrect tip selection. Additionally, a smart feature included in the whole eLINE product range is the unique electronic tip ejection, which reduces the risk of RSI (Repetitive Strain Injury).

eLINE Dispenser offers

- TipGuide – automatic guide for correct tip selection
- Outstanding ergonomics – dispensing with minimum force
- Unique electronic feather light tip ejection
- Comprehensive range of liquid handling protocols with easy programming
- Contamination-free dispensing with positive displacement principle
- Volume range from 1 µl to 50 ml
- 5 speeds for aspiration and dispensing
- Charging indicator
- Direct charging option enabling dispensing while charging
- Compatibility with eLINE charging stand and carousel
- Compatibility with other dispenser tip brands

eLINE Dispenser operating modes

- Multiple Dispensing (d)
- Pipetting (P)
- Diluting (dd)
- Sequential Dispensing (Sd)
- Automatic Multiple Dispensing (Ad)
- Multi-Aspirating (SA)
- Custom mode (CST)
  - GL (select service intervals)
  - Sr (select the desired tip range)
  - SET (returns default settings)

eLINE Dispenser Ordering details

Cat. No.	Item
73070X	Biohit eLINE Dispenser
73098X	Biohit eLINE Charging Stand, with AC-adaptor
73099X	eLINE Charging Carousel for 4 pipettors, with AC-adaptor
731001	eLINE replacement battery

X: 0 =Without AC-adaptor, 1 = With AC-adaptor, Euro; 2 = With AC-adaptor, U.S.; 3 = With AC-adaptor, U.K.; 4 = With AC-adaptor, Jpn; 5 = With AC-adaptor, Aus
Biohit has several worldwide patents and patents pending for its products.

Save your time, let the TipGuide make the tip choice for you

- No time consuming volume calculations
- Just set the desired volume and number of dispensings, the TipGuide selects and displays the suitable tip size

Direct charging option with AC-adaptor with immediate dispensing possibility
Clear LCD-display with all the information you need
Easy-to-use keypad enables fast programming
Both left- and right-handed operation
Electronic start button for all pipetting operations
Attractive ergonomic design means minimal effort
Easy & light tip insertion
Unique electronic one-touch tip ejection
BIOHIT
www.biohit.com

New member of the eLINE family!

BIOHIT
Innovating for Health

Biohit Mechanical Stepper

The Biohit Mechanical Stepper is an easy to use positive displacement dispenser which allows rapid multi-dispensing of pre-set volumes up to 48 times in succession without refilling.

The unit comes complete with an adapter for 25 ml and 50 ml tips.

Features include:

- Easy single handed operation
- Lightweight (105 g) yet robust construction
- Maintenance-free design
- Compatible with a wide range of dispenser tips
- Ideal for dispensing aqueous and viscous liquids
- Dispensing volumes from 1 µl to 5000 µl (min. volume with Biohit Dispenser Tips is 2 µl)
- Its ergonomic design and positioning of the dosage button in the upper part of the device allow single-handed volume selection, loading and dispensing.
- Choose quickly and effectively according to the requirements of your applications between the highest precision or maximum repetitions of your desired dosage volume.
- 48 dispensing steps at intervals of 1 second without the need to refill thus saving 90 % of the working time required by the usual pipetting technique
- Tested according to ISO 8655-1

Biohit Mechanical Stepper and Biohit Dispenser Tip system Performance specifications

Tip volume (ml)	Dosage volume					Imprecision(%)	Inaccuracy(%)
Adjustment on dispenser	1	2	3	4	5		
Number of steps	48	23	15	11	8		
0.10	2 µl	4 µl	6 µl	8 µl	10 µl	< 1.6 %	< ± 3.0 %
0.20	4 µl	8 µl	12 µl	16 µl	20 µl	< 1.3 %	< ± 2.0 %
0.50	10 µl	20 µl	30 µl	40 µl	50 µl	< 0.5 %	< ± 0.8 %
1.00	20 µl	40 µl	60 µl	80 µl	100 µl	< 0.9 %	< ± 0.9 %
2.50	50 µl	100 µl	150 µl	200 µl	250 µl	< 0.4 %	< ± 0.8 %
5.00	100 µl	200 µl	300 µl	400 µl	500 µl	< 0.3 %	< ± 0.4 %
10.00	200 µl	400 µl	600 µl	800 µl	1000 µl	< 0.5 %	< ± 0.6 %
25.00	500 µl	1000 µl	1500 µl	2000 µl	2500 µl	< 0.3 %	< ± 0.2 %
50.00	1000 µl	2000 µl	3000 µl	4000 µl	5000 µl	< 0.2 %	< ± 0.2 %

The data for tips 0.5 and 2.5 ml are based on a measurement carried out with a 100 µl pipette tip.
The performance specifications apply to the Biohit Mechanical Stepper and Biohit Dispenser Tips (non-sterile) System.

Ordering Details

Cat. No.	Description
725700	Biohit Mechanical Stepper including adapter for 25 ml and 50 ml syringe tips

Biohit Dispenser Tips

Features:

- Function according to positive displacement principle
- Contamination free dispensing – no aerosols are formed
- Made of virgin polypropylene (tip) and polyethylene (plunger)
- 9 different tip sizes from 0.1 to 50 ml
- DNase, RNase, ATP and Pyrogen (Endotoxin) free
- Pre-sterilized tips are individually wrapped
- Suitable for use together with eLINE Dispenser and Biohit Mechanical Stepper, as well as most other mechanical steppers

Biohit Dispenser Tip package Ordering details

Volume (ml)	Package	Qty/Unit	Cat. No.
Starter Kit	Includes 20 * 0.5 ml 20 * 1.0 ml 20 * 2.5 ml 20 * 5.0 ml 20 * 10.0 ml	100	792038
0.1	Non sterile Pre-sterilized	100 100	792017 792026
0.2	Non sterile Pre-sterilized	100 100	792018 792027
0.5	Non sterile Pre-sterilized	100 100	792019 792028
1.0	Non sterile Pre-sterilized	100 100	792020 792029
2.5	Non sterile Pre-sterilized	100 100	792021 792030
5.0	Non sterile Pre-sterilized	100 100	792022 792031
10.0	Non sterile Pre-sterilized	100 100	792023 792032
25.0 *	Non sterile	25 *	792024
50.0 *	Non sterile	25 *	792025
Adapter for 25 and 50 ml tips, 3 pcs./unit			792036

* Includes 1 adapter/unit

eLINE Dispenser and Biohit Dispenser Tip system Performance specifications

Tip volume (ml)	Volume min/max (µl)	Increment (µl)	Step size max (µl)	Test volume (µl)	Inacc. (%)	Impr. (%)	Number of dispensings min/max
0.1	1/100	0.2	100	10 100	1.00 % 1.00 %	2.00 % 0.50 %	1/100
0.2	2/200	0.4	200	20 200	1.70 % 1.50 %	1.00 % 0.20 %	1/100
0.5	5/500	1	500	50 500	0.80 % 0.80 %	0.80 % 0.40 %	1/100
1.0	10/1000	2	1000	100 1000	0.80 % 0.80 %	0.55 % 0.20 %	1/100
2.5	25/2500	5	2500	250 2500	0.50 % 0.50 %	0.55 % 0.20 %	1/100
5.0	50/5000	10	5000	500 5000	0.80 % 0.80 %	0.50 % 0.15 %	1/100
10.0	100/10 000	20	10 000	1000 10000	0.25 % 0.30 %	0.50 % 0.20 %	1/100
25.0	500/25 000	50	25 000	2500 25000	0.50 % 0.50 %	1.00 % 0.15 %	1/50
50.0	1000/50 000	100	50 000	5000 50000	0.40 % 0.40 %	0.80 % 0.15 %	1/50

The performance specifications apply to the eLINE Dispenser and Biohit Dispenser Tip (non sterile) System.
Due to Biohit's continuous R&D, specifications may change without prior notice.

BIOHIT
Innovating for Health

Special solutions for higher performance

Even when you handle liquids with bigger volumes, you still can do it easily and lightweight. As long as you do it with Biohit! For maxi-volume liquid handling, Biohit offers you a wide range of pipetting controllers and fillers: Biofiller is a lightweight and easy-to-use pipette filler. Midi Plus, Midi Pro and Proline XL are battery operated, rechargeable pipetting controllers. Prospenser Bottle-Top Dispenser and Biotrate Digital Burette provide hassle-free and accurate dispensing.

Adjustable head allows full rotation for optimum ergonomical pipetting
Hydrophobic autoclavable filter prevents over-aspiration
Changeable and autoclavable adapters allow use with most common serological pipette sizes up to 25 ml as well as 5 ml and 10 ml Biohit disposable tips
Less risk of Repetitive Strain Injury (RSI) due to unique ergonomic design that is especially suitable for working under laminar airflow cabinets
Simple keypad allows easy error-free selection of liquid handling functions
Locking button keeps the adapter in place and allows easy change of the included adapters
Two electronic start buttons for all operations
Included recharging base keeps the XL ready for use
BIOHIT

CE
IVD

Proline XL operation modes:

- Pipetting
- Multiple Dispensing
- Sequential Dispensing
- Manual Pipetting

Proline XL – Excel in maxi-volumes

In addition to being a pipette controller for 1 to 25 ml serological pipettes, the Biohit Proline XL can be used as an electronic pipettor and dispenser with 5 and 10 ml disposable tips. The Proline XL can be easily programmed for exact operations with either of the buttons acting as a trigger to start the operation. For example, the XL can be programmed to automatically dispense 10 x 1 ml to fill the cell culture plate, which saves time and eliminates the need for visual control of pipetting. Moreover, the results are always reproducible.

Ergonomic design of the XL allows optimal working height even with 25 ml serological pipettes.

Proline XL offers:

- Efficient working with computerized drive system or manually
- Single-point calibration
- Possibility to handle a full volume range of 0.1 to 25 ml
- Improved precision and accuracy
- 5 speeds for aspiration and dispensing
- Easy access to bottles and tubes

Proline XL Performance specifications

Performance	Inaccuracy	Imprecision
25 ml graduated pipette: P-mode 25 ml P-mode 2 ml d-mode 10 x 2.5 ml	 0.40 % 1.40 % 1.00 %	 0.30 % 0.60 % 1.50 %
Biohit 10 ml tip: (see page 45) P-mode 10 ml P-mode 1 ml d-mode 10 x 1 ml	 0.50 % 2.40 % 1.00 %	 0.15 % 0.30 % 1.30 %
Biohit 5 ml tip: (see page 45) P-mode 5 ml P-mode 0.5 ml d-mode 10 x 0.5 ml	 1.00 % 4.20 % 1.70 %	 0.20 % 0.60 % 1.50 %
Battery: Min 500 full cycles. Weight: 260 g.		

The specifications are type test specifications achieved under strictly controlled conditions (ISO 8655). Due to Biohit's continuous R&D, specifications may change without prior notice.

Proline XL Ordering details

Cat. No.	Item	Qty/Unit
71090X	Proline XL	1
712912	Replacement Filter, autoclavable, 0.45 µm	5
712913	Replacement Filter, sterile, 0.45 µm	1
780300	Biohit Tip 5 ml	100
780310	Biohit Tip 10 ml	100

X: 1=AC-adaptor, Euro; 2=AC-adaptor, U.S.; 3=AC-adaptor, U.K.; 4=AC-adaptor, Jpn

Midi Plus™ & Midi Pro – The Super Controllers

Midi Plus and Midi Pro are rechargeable pipetting controllers that operate with rechargeable battery. Both instruments are suitable for all types of pipettes in the range of 1 to 100 ml. Midi Plus and Midi Pro fit the hand comfortably and are ideal for use within a laminar flow or microbiological safety cabinet. Both models include a low battery indicator, and both are CE marked.

Midi Plus™

Hydrophobic autoclavable filter prevents over-aspiration

Optional adapters (as accessory) allowing the unit to be used also with the Biohit 5 ml and 10 ml pipettor tips

Operating buttons

Stepless speed control allows for the aspiration and dispensing speed to be adjusted easily and precisely to suit either large or small volume pipettes

Attached Support*
- Prevents pipette contamination
- Saves space
- Allows the unit to be rested on a table with pipette attached

CE

IVD

Midi Pro

Operating buttons

Selection of high or low modes allowing variable aspirate and dispense speeds (with blowout)

Unique stand suitable for bench or wall mounting is supplied with the unit

CE

*Not available in units sold in the United States

Midi Plus & Midi Pro Selection guide

Feature	Midi Plus™	Midi Pro
Pipette types	Plastic or glass 1-100 ml Pasteur pipettes 5 ml and 10 ml Biohit pipette tips	Plastic or glass 1-100 ml Pasteur pipettes
Rechargeable during use	X	X
Adjustable speed	Stepless speed control	High and low speed modes
Gravity dispensing	X	X
Stand	Attached support	Suitable for bench and wall mounting
Optional adapters for 5 & 10 ml pipette tips	X	
Weight	207 g	180 g (without stand)
Low battery indicator	X	X
Autoclavable parts	Nose cone, pipette holder and filter	Pipette holder

Midi Plus & Midi Pro Technical specifications

Feature	Midi Plus	Midi Pro
Batteries	AA, 3 x 1.2 V, 270 mAh, NiCd	2 x 1.2V NiMH
Charging batteries	14 hours for completely empty battery	14 hours for completely empty battery
Battery service life (from empty)	Approx. 7 hours service life when fully charged	500 – 1000 cycles
AC-adaptor	Output voltage 9 V DC	Output 75/10 mA DC
Filters	Hydrophobic 0.45 µm	Hydrophobic 0.45 µm or 0,2 µm
Case material	ASA + PC	ASA
Nose cone material	PVDF (autoclavable)	ASA
Pipette holder	Silicone (autoclavable)	Silicone (autoclavable)

Midi Plus & Accessories Ordering details

Cat. No.	Item	Qty/Unit
71093X	Midi Plus Pipetting Controller with AC-adaptor	1
712912	Replacement filter, 0.45 µm, autoclavable	5
712913	Replacement filter, sterile, 0.45 µm	1
711015*[1]	Adapter set for 5 ml tip	1
711016*[1]	Adapter set for 10 ml tip	1
780300	Biohit tip 5 ml	100
780310	Biohit tip 10 ml	100

X: 1=AC-adaptor, Euro; 2=AC-adaptor, U.S.; 3=AC-adaptor, U.K.; 4=AC-adaptor, Jpn
*1 Note: Adapter set includes both the nose cone (PVDF) and the silicon adapter.

Midi Pro & Accessories Ordering details

Cat. No.	Item	Qty/Unit
71091X	Midi Pro Pipetting Controller with AC-adaptor	1
721962	Replacement filter, 0.45 µm	5
721965	Replacement filter, 0.2 µm	5
721966	Replacement filter, sterile, 0.2 µm	1
721963	Replacement silicone pipette holder	1

X: 1 = Euro AC-adaptor; 2 = U.S. AC-adaptor; 3 = U.K. AC-adaptor;
4 = Japan AC-adaptor; 5 = Australian AC-adaptor (available only for MidiPro)

The Midi Pro is fitted with a 0.45µm filter and supplied complete with charger, two spare hydrophobic filters (1x 0.45µm and 1x 0.2µm), bench stand and instruction manual.

Biofiller
- Basic pipetting at its best

Biofiller is a uniquely designed, lightweight and easy-to-use pipette filler with an ultra-squeezable bulb to provide smooth, manual pipetting control in both aspirating and dispensing, using 1 ml to 100 ml pipettes.

Simply squeeze the large silicone bulb, and the thumb lever controls both the aspirating and dispensing modes, with a button to blow-out residual contents of pipette if required.

Biofiller offers:

- Comfortable and simple to use
- Precise pipetting control
- Robust and lightweight
- Large capacity bulb
- Compatible with blow-out pipettes
- Simple thumb button operation
- Uses integral 0.45 µm, replaceable membrane filter to ensure liquid is not accidentally drawn into the unit
- Autoclavable silicone pipette holder

Biofiller Ordering details

Cat. No.	Item	Qty/Unit
723039	Biofiller Pipette Filler with integral 0.45 µm filter	1
721963	Replacement silicone pipette holder	1
721962	Replacement filter, 0.45 µm	5
721965	Replacement filter, 0.2 µm	5
721966	Replacement filter, sterile, 0.2 µm	1

Easy to adjust calibration mechanism
Borosilicate glass barrel protected with a transparent polypropylene sleeve
Easily removable PTFE piston for cleaning and smooth action
Fine adjustment for exact and reproducible dispensing
Anti-drip tap
Chemically resistant liquid pathway
Precision valve mechanism ensures easy priming and minimum waste with no leakage back into the reservoir - the Prospenser stays fully primed all day
Bubble free dispensing
121°C
Fully autoclavable

Prospenser Bottle-Top Dispenser

The easy-to-use Prospenser delivers trouble-free and reliable dispensing of liquids including strong acids, alkalis and solvents.

- All models are fitted with an anti-drip safety valve, a feature which guards against drips when the Prospenser is not in use.
- A fine adjustment mechanism allows for even greater reproducibility for repeat dispensing.
- Unlike other bottle-top dispensers, the Prospenser's glass barrel can be disassembled from the pedestal for thorough cleaning. This also ensures that in the unlikely event of damage, you can replace the glass barrel as a spare part rather than have to buy a new dispenser.
- The head can be conveniently rotated 360° for operator safety and comfort.
- Wide range of adapters are included to fit the most common bottle sizes.
- Optional extendable delivery jet allows fast and safe dispensing even to narrow tubes.

Prospenser Performance specifications and ordering details

Cat. No.	Item	Increment	Max Volume	Inacc. (%)	Impr. (%)
723049	Prospenser 0.01–2.5 ml (with 38, 40 and 45 mm adaptors)	0.05 ml	2.5 ml	0.3 %	0.1 %
723050	Prospenser 0.1–5 ml (with 38, 40 and 45 mm adaptors)	0.1 ml	5 ml	0.3 %	0.1 %
723051	Prospenser 0.2–10 ml (with 38, 40 and 45 mm adaptors)	0.2 ml	10 ml	0.3 %	0.1 %
723052	Prospenser 1–30 ml (with 38, 40 and 45 mm adaptors)	1.0 ml	30 ml	0.3 %	0.1 %
723053	Prospenser 1–50 ml (with 38. 40 and 45mm adaptors)	1.0 ml	50 ml	0.3 %	0.1 %
721998	Extendable delivery jet (see picture)				

Please note that the Prospenser is not supplied with a reservoir

Continuous display of volume dispensed with zero reset feature for multiple titrations
Simple user calibration and factory reset for ISO 9000 and GLP requirements
Visible borosilicate glass barrel protected with a transparent polypropylene sleeve allows inspection of liquid before dispensing
Chemically resistant and autoclavable liquid pathway
Bubble free dispensing
Anti-drip tap
30.00
BIOHIT
Biotrate
121°C
Autoclavable liquid pathway

Biotrate Digital Burettes 0–30 and 0–50 ml

The streamlined Biotrate digital burette and dispenser delivers accurate, precise and convenient bottle-top titration, as well as optimum operator safety.

- The head can be conveniently rotated 360° for operator safety and comfort.
- See-through barrel ensures bubble-free titration.
- Automatic switch-off without losing the previous titrated volume, when left unattended
- No dripping when in static mode
- A new safety pedestal valve allows the Biotrate fluid path to be turned off manually to prevent accidental delivery. Its right-angled spout is also designed to enhance safety in use.

- Robust outer casing does not move during the priming or dispensing sequences.
- PTFE plunger and borosilicate glass barrel allow dispensing of aqueous solutions and some aggressive liquids.
- Powered by a 3.6V lithium battery giving a minimum life of 60,000 three-minute titrations. Automatic low battery voltage is indicated on the large easy-to-read LCD window.

Biotrate Performance specifications and ordering details

Cat. No.	Item	Increment	Inacc. (%)	Impr. (%)
723054	Biotrate 0–30 ml (with 33, 38 and 45mm adaptors)	0.01 ml	0.2 %	0.1 %
723055	Biotrate 0–50 ml (with 33, 38 and 45mm adaptors)	0.01 ml	0.2 %	0.1 %
721998	Extendable delivery jet (see picture page 42)			

Please note that Biotrate is not supplied with reservoir

BIOHIT
Innovating for Health

Tailored solutions for customer-specific systems

Yes, it is a true story. Biohit is a leading provider of tailor-made (OEM, Original Equipment Manufacture) solutions to customers who require a little more from their liquid handling devices. Thanks to our know-how, inventiveness and experience, we can take care of the whole process from engineering concept to dispatch. Custom-made only for you.

Biohit OEM Solutions – Safe, reliable and easy to use

In many applications, such as diagnostic test and analysis systems, the accuracy of the results and reliability of the system are mission-critical. This requires a lot from all components of the system, also the pipettor.

Biohit places a great emphasis on accuracy, precision, safety and user-friendliness of its products. Its application-specific solutions have been carefully manufactured according to the requirements of international quality standards. As a customer you can rest assured; Biohit solutions allow you to improve not only the safety and reliability, but also the ease-of-use of your system.

Custom-made for your needs

Biohit has developed different technologies that can be applied in custom-made solutions. These include both electronic and mechanical liquid handling pipettor platforms. The Start mLINE, eLINE, Proline and the new rLINE robotic dispenser module families are easy-to-adapt platforms for your system. For more specific needs, Biohit offers tailored solutions based on any of its pipettors.

To learn more about Biohit's OEM solutions, contact us at info@biohit.com.

The Start mLINE is a pipettor based on any mLINE model that is equipped with an on/off switch and cable. This can be used with coagulation analysers or any other instruments that require precise timing.

The RS eLINE platform enables the integration of the instrument and the pipettor. A flexible cable between the instrument and the pipettor provides both the power supply and the operational control via RS 232 communication. The solution is based on the Biohit single- and multichannel eLINE electronic pipettors.

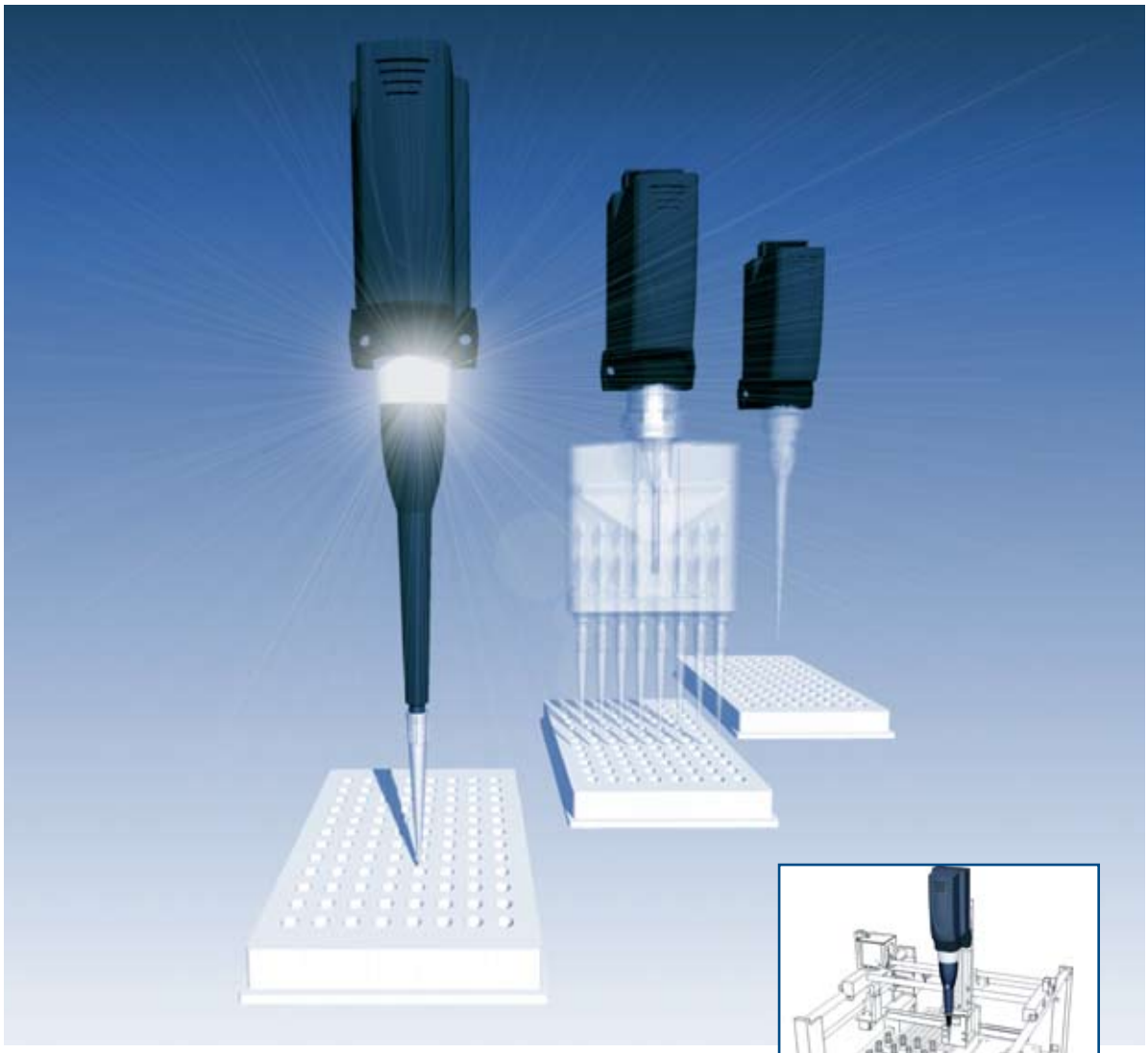
For example, Pentapharm GmbH in Germany has developed a whole blood Point-of-Care coagulation system, the ROTEM® System, with the RS eLINE as a key component. The system is designed to reduce the risk of transfusion errors in critical surgery such as liver transplant, cardiac or vascular surgery, orthopaedic or trauma surgery.

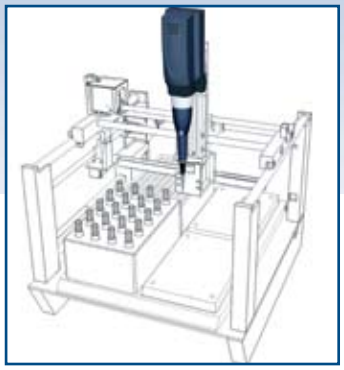
Solutions for leading-edge companies

Tailor-made solutions are a speciality of Biohit. Several leading-edge companies have for years been implementing variations of Biohit electronic and mechanical pipettors into their systems. Some of these internationally recognised companies have developed very specific applications with the R&D team of Biohit to exploit their own market niche.

The customer base includes global market leaders such as

- Pentapharm (picture)
- 3M
- bioMérieux
- Johnson & Johnson Group companies





Biohit rLINE® – The ultimate OEM Dispenser Module

The unique rLINE Robotic Dispenser Module has been developed as an ideal front-end liquid handling tool for robotic sample processing. This technology platform combines numerous unique and innovative features, like electronic tip ejection and Optiload tip pick-up to improve high quality performance and functionality of sample processors and automated instrumentation.

The rLINE Robotic Dispenser Module is offered as OEM platform for tailored products ranging from 1 to 1000 µl as single-channel and 1 to 1200 µl as 8-channel. Additionally, a 250 µl single-channel version is available as off-the-shelf for evaluation and feasibility purposes. Robotic 250 µl tips in robotic racks are also available off-the-shelf.

The rLINE platform features and options:

- Compact, space-saving design
- Fast and easy installation
- Zero cross contamination
- Integrated electronic tip ejector
- Versatile serial interface (RS-232 & RS-485 & CANBUS)
- Low voltage, low current consumption
- Liquid level sensor
- Micro volume dispensing options

For more information on rLINE and other customer-specific solutions, please visit www.biohit.com or contact Biohit at info@biohit.com

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DNase • RNase • Endotoxin Free
BIOHIT CERTIFIED

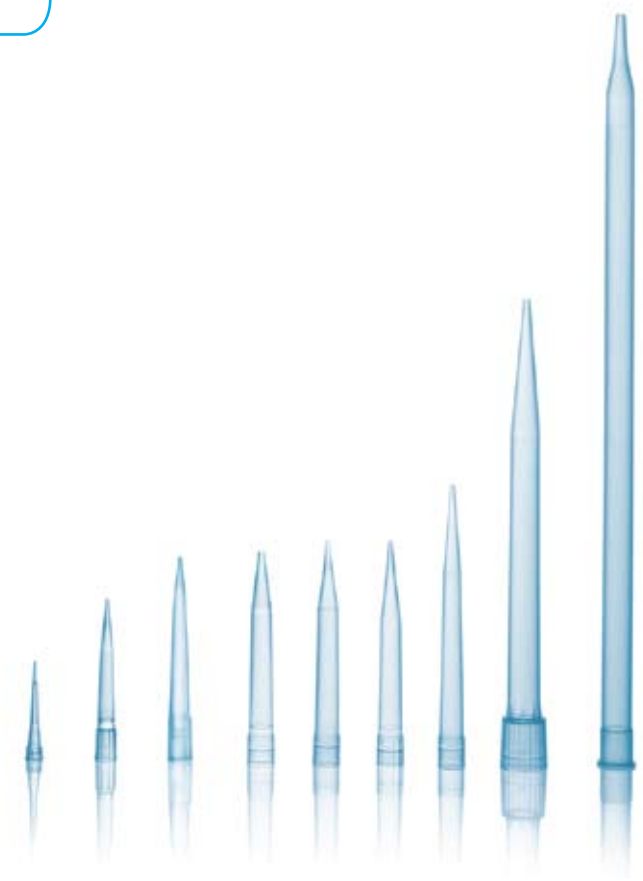
121°C

Fully autoclavable

CE

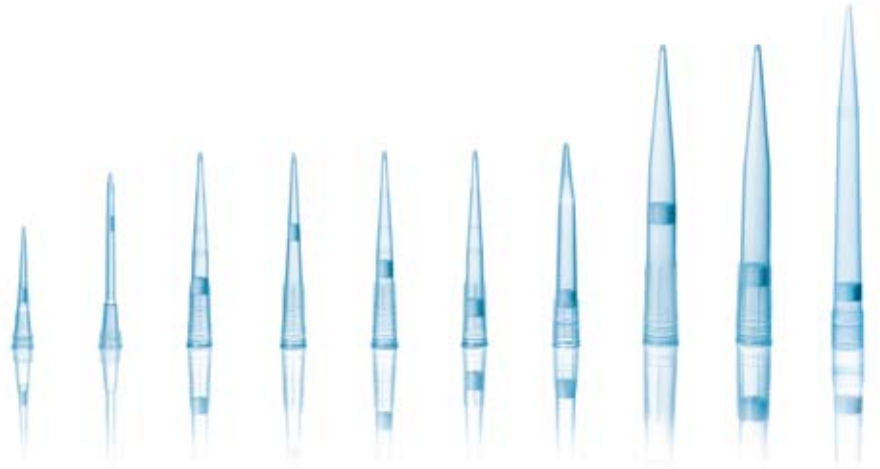
IVD

Made in Finland



Standard Tips

Biohit Standard Tips are made of premium-grade virgin polypropylene. The tips are metal-free and available in autoclavable (121°C; 20 min; 1 bar) Single Tray boxes (as certified RNase, DNase and endotoxin free), in space saving Refill System and in Bulk packages. Electron beam pre-sterilized tips in trays are also available.



Filter Tips

Biohit Filter Tips are made of virgin polypropylene and feature filter (PE) barriers to prevent aerosol and liquid contamination. This helps protect against the risk of cross-contamination and reduces maintenance requirements of the pipettor. Filter tips are tray-packed, electron beam pre-sterilized and certified as RNase, DNase and endotoxin free.

Best tip ever – premium pipettor tips from Biohit

Biohit offers you precision-made pipettor tips for use with all Biohit and most other brand pipettors providing excellent reproducibility and accuracy. All standard tips and trays are autoclavable. You can purchase these natural polypropylene tips in single trays as non-sterile or pre-sterilized, in refills and in bulk packaging. And last but not the least, Biohit tips are manufactured in a protected environment, following Good Manufacturing Practices (GMP).

Single Tray boxes for safer laboratory work

The Single Tray tip boxes are a must for demanding laboratory work. The rigid and strong polypropylene boxes and trays are fully autoclavable. The tray holds 96 highest grade non-wettable virgin polypropylene tips in an 8 x 12 microplate format.
The flip-top boxes can be opened and closed with a single hand. The colour coding of the tip trays allows immediate tip volume recognition. Non-sterile and pre-sterilized standard tips are available in single trays as certified RNase, DNase and endotoxin free as well as metal-free.

Autoclaving instructions on page 81

Biohit tips and boxes are made of recyclable material

- Tips, trays & boxes: polypropylene (PP)
- Filters in filter tips: polyethylene (PE)

The ecological Refill System

The Refill System of Biohit is environmentally friendly with a completely recyclable packaging. The tip trays are easily transferred from a space-saving Tower or Refill Pack to the Single Tray tip boxes. The Refill System range covers the five most popular standard tip sizes.

Bulk Tips – the economic option

The most economic alternative is to buy Bulk Tips that are available in boxes with 100, 400 or 1000 standard tips (depending on tip size, see ordering details). However, no compromises are made regarding the quality and the bulk tips undergo the same rigid quality control as other Biohit tips.

Instructions on how to use the Refill Tower for 10, 300 and 350 µl tips

- Remove the empty tray from the tip box.

- Lift up the upper part of the tower box.

- Take one single-tray from the refill tower.

- Put the single-tray into the empty tip box.

Instructions on how to use the Refill Pack for 1000 and 1200 µl tips

- Detach a Refill Pack.

- Open the cover film from the marked corner.

- Remove the empty tray from the tip box.

- Take the tip tray from the Refill Pack and put it into the empty tip box.

Every pipettor needs the best tip

In liquid handling, the pipettor and the tip always form a system. Biohit tips have been developed to perfectly match Biohit pipettors. By developing and producing both pipettors and tips Biohit is able to offer the best possible compatibility and pipetting results.

For example, the unique Optiload tip loading mechanism (see picture) of mLINE and eLINE pipettors allows tips to be loaded with constant force, which, in turn, secures optimal tip sealing and minimum tip ejection force.

Rigorous quality control to ensure accurate pipetting results

As the tip is an integral component of the pipetting system, its shape, material properties and fit have a considerable influence on pipetting accuracy. Variation in any of these will cause errors in the volume pipetted.

Quality is not automatically guaranteed unless the quality control (QC) process of the manufacturer is strictly controlled. All Biohit tips are fully traceable - mould cavity identification markings are printed in each tip and tip boxes are lot numbered. The quality control includes thorough in-house testing and checks. Each lot of the single tray products is also tested and certified as RNase, DNase and endotoxin free.

The quality management system follows not only ISO 9001, but also ISO 13485 (ISO standard for medical devices), which enables Biohit to give CE / IVD (In Vitro Diagnostics) certification for both pipettors and pipettor tips.

DNase • RNase • Endotoxin Free BIOHIT CERTIFIED

BIOHIT ISO 9001 / 13485 / 14001 CERTIFIED

CE IVD

121°C

All single tray products are tested and certified for purity by an independent laboratory.

Biohit pipettor tips are:

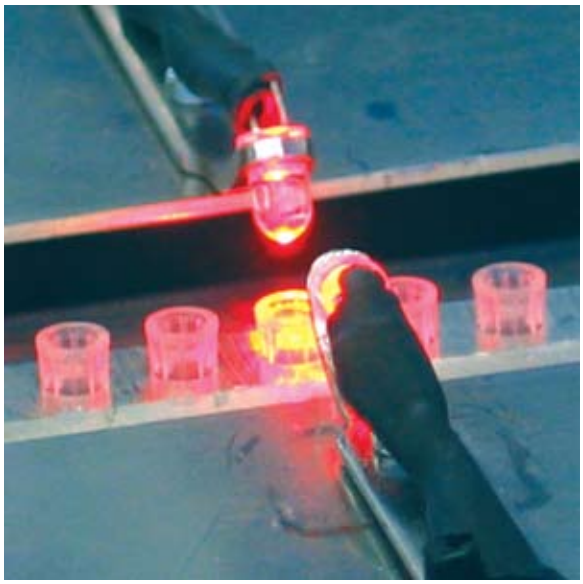
Made in Finland

- Made to match Biohit pipettors
- Made of high quality pure virgin polypropylene
- Free from dust or particles
- Certified free from metals, like cadmium
- Matched with the pipettor tip cone for secure sealing and easy tip ejection
- Highly resistant to chemicals
- Highly thermally resistant
- Autoclavable
- Packed in easy-to-use, fully recyclable and environmentally friendly (ISO 14001) packages
- CE/IVD marked and covered by ISO 13485
- Subject to tight quality control
- Traceable: Mould cavity identification markings in each tip and lot numbered tip packages

Clean room quality manufacturing

The manufacturing process and the environment in which the pipettor tips are moulded and packaged are potential sources of contamination. If tips are manufactured in an open environment, they may not be contaminant free. As the tip is an integral component of the pipetting system, its shape, fit, material properties and especially manufacturing processes, have a considerable influence on the pipetting accuracy, purity and the pipetting results.

The certified Biohit pipettor tips have been carefully manufactured in a protected environment in Finland. To avoid contamination from human contact, Biohit has automated the whole manufacturing process. All Biohit tips are fully traceable from inspection of raw materials to monitoring the final product and testing each lot for contaminants after production.



The automatic camera checks each 10 µl Biohit pipettor tip thus ensuring the quality control of every individual tip.

Biohit's tip production consists of experienced personnel, high capacity injection moulding technology and premium grade pure polypropylene (PP). Equally important are automated, clean production conditions, from the raw material to the final product. To minimise contamination, special particle filtration (HEPA) and positive pressure are applied to keep contaminants out of the manufacturing area. The pure polypropylene plastic material is automatically fed from silos through vacuum loaders to moulding machines. The moulding machines are located in closed environments with robots automatically loading the tips onto the tip trays and moving the loaded trays to packaging. All machines and robots are constantly monitored by dedicated software.

All Biohit tip trays are individually and automatically wrapped in air-tight plastic to rule out any danger of contamination. Personnel in production and packaging are highly experienced, trained and equipped with the appropriate, specially designed protective clothing, masks, hair nets and gloves to diminish the contamination risks.

Automated tip manufacturing process from handling of raw material to packaging and storage.

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Single Tray

Refill Pack

Refill Tower

Bulk Tips

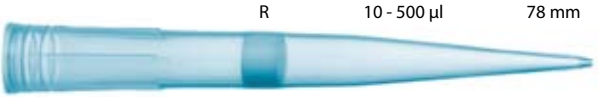
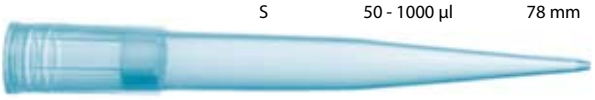
Biohit Standard Tips

	Tip	Tip ID	Volume Range	Length	Packaging	Type	Qty/Unit	Cat. No.
		A	0.1 - 10 µl	31.5 mm	Single Tray Single Tray Refill Tower Bulk in Box	Non Sterile Pre-Sterilized Non Sterile Non Sterile	10 x 96 Tips 10 x 96 Tips 10 x 96 Tips 1000 Tips	790010 790011 790012 781349
		C	0.5 - 300 µl	51 mm	Single Tray Single Tray Refill Tower Bulk in Box	Non Sterile Pre-Sterilized Non Sterile Non Sterile	10 x 96 Tips 10 x 96 Tips 10 x 96 Tips 1000 Tips	790300 790301 790302 780011
New design		D	5 - 350 µl	54 mm	Single Tray Single Tray Refill Tower Bulk in Box	Non Sterile Pre-Sterilized Non Sterile Non Sterile	10 x 96 Tips 10 x 96 Tips 10 x 96 Tips 1000 Tips	790350 790351 790352 780033
New Refill Pack		E	10 - 1000 µl	71.5 mm	Single Tray Single Tray Refill Pack Bulk in Box Bulk in Box	Non Sterile Pre-Sterilized Non Sterile Non Sterile Non Sterile	10 x 96 Tips 10 x 96 Tips 10 x 96 Tips 400 Tips 1000 Tips	791000 791001 791002 780021 780016
	Wide Bore Tip	G	10 - 1000 µl	68.5 mm	Single Tray Single Tray Bulk in Box	Non Sterile Pre-Sterilized Non Sterile	10 x 96 Tips 10 x 96 Tips 1000 Tips	791020 791021 780053
New Refill Pack		H	50 - 1200 µl	71.5 mm	Single Tray Single Tray Refill Pack Bulk in Box	Non Sterile Pre-Sterilized Non Sterile Non Sterile	10 x 96 Tips 10 x 96 Tips 10 x 96 Tips 1000 Tips	791200 791201 791202 780043
	Extra Long Tip	Z	50 - 1200 µl	90 mm	Single Tray Single Tray	Non Sterile Pre-Sterilized	10 x 96 Tips 10 x 96 Tips	791210 791211
		J	100 - 5000 µl	150 mm	Single Tray Single Tray Bulk in Box Bulk in Carton	Non Sterile Pre-Sterilized Non Sterile Non Sterile	50 Tips 50 Tips 100 Tips 1000 Tips	780304 780305 780300 780308
	Extra Long Tip for XL and Midi Plus	K	0.5 - 10 ml	242 mm	Bulk in Box	Non Sterile	100 Tips	780310
New tip		U	1-10 ml	161 mm	Bulk in Box	Non Sterile	250 Tips	780315

Empty Tip Boxes for Refill System (tips and trays are not included)

Item	Tip ID	Tip Type (Standard Tips)	Qty/Unit	Cat. No.
Empty Tip Box for Refill System	A, C, D	10, 300, 350 µl	10	790910
Empty Tip Box for Refill System	E, H	1000, 1200 µl	10	790920

Biohit Filter Tips

Tip	Tip ID	Volume Range	Length	Packaging	Type	Qty/Unit	Cat. No.	
	L	0.1 - 10 µl	31,5 mm	Single Tray	Pre-Sterilized	10 x 96 Tips	790011F	New design
	M	0.1 - 10 µl	46 mm	Single Tray	Pre-Sterilized	10 x 96 Tips	783201	
	N	0.5 - 20 µl	51 mm	Single Tray	Pre-Sterilized	10 x 96 Tips	790021F	New design
	O	2 - 120 µl	51 mm	Single Tray	Pre-Sterilized	10 x 96 Tips	790101F	New design
	P	5 - 200 µl	54 mm	Single Tray	Pre-Sterilized	10 x 96 Tips	790201F	New design
	Q	5 - 300 µl	52.5 mm	Single Tray	Pre-Sterilized	10 x 96 Tips	783207	
	R	10 - 500 µl	78 mm	Single Tray	Pre-Sterilized	10 x 100 Tips	783206	
	S	50 - 1000 µl	78 mm	Single Tray	Pre-Sterilized	10 x 100 Tips	783208	
	T	50 - 1200 µl	90 mm	Single Tray	Pre-Sterilized	10 x 96 Tips	783222	New design

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Mechanical Pipettors

	Cat. No.	µl	Standard Tips A*	C	D	E	J	U	Filter Tips L	M	N	O	P	Q	R	S	Special Tips G
			10	300	350	1000	5000	10 000	10	10 Ext.	20	120	200	300	500	1000	1000 WB
mLINE	725010	0.1-3	●						●	●							
Single Channel	725020	0.5-10	●						●	●							
	725030	2-20		●							●						
	725050	10-100		●	●							●					
	725060	20-200		●	●								●	●			
	725070	100-1000				●										●	●
	725080	500-5000					●										
	725090	1-10 ml						●									
8-Channel	725120	0.5-10	●						●	●							
	725130	5-100		●	●							●					
	725140	30-300			●								●				
12-Channel	725220	0.5-10	●						●	●							
	725230	5-100		●	●							●					
	725240	30-300			●									●			
Proline Plus	728010	0.1-3	●						●	●							
Adjustable Volume	728020	0.5-10	●						●	●							
Single Channel	728030	2-20		●							●						
	728050	10-100		●	●							●					
	728060	20-200		●	●								●	●			
	728070	100-1000				●										●	●
	728080	500-5000					●										
	728090	1-10 ml					●										
	728590	10 ml						●									
8-Channel	728120	0.5-10	●						●	●							
	728130	10-100		●	●							●					
	728140	30-300			●									●			
12-Channel	728220	0.5-10	●						●	●							
	728230	10-100		●	●							●					
	728240	30-300			●									●			
Proline Plus	728515	5	●						●	●							
Fixed Volume	728520	10	●						●	●							
Single Channel	728530	20		●							●						
	728535	25		●								●					
	728545	50		●								●					
	728550	100		●	●							●					
	728560	200		●	●								●	●			
	728565	250				●									●	●	●
	728567	500				●									●	●	●
	728570	1000				●										●	●
	728575	2000					●										
	728580	5000					●										
	728590	10 ml						●									
Proline	720005	0.1-2.5	●						●	●							
Adjustable Volume	720000	0.5-10	●	●					●	●	●						
Single Channel	720080	2-20		●							●	●					
	720020	5-50		●	●							●					
	720050	10-100		●	●							●	●	●			
	720070	20-200		●	●								●	●			
	720060	100-1000				●										●	●
	720110	1000-5000					●										
8-Channel	720210	0.5-10	●						●	●							
	720220	5-50		●	●							●	●	●			
	720240	50-300			●									●			
12-Channel	720310	0.5-10	●						●	●							
	720320	5-50		●	●							●	●	●			
	720340	50-300			●									●			
Proline	722001	5	●	●					●	●	●						
Fixed Volume	722004	10	●	●					●	●	●						
Single Channel	722010	20		●	●						●	●					
	722015	25		●	●							●					
	722020	50		●	●							●					
	722025	100		●	●							●	●	●			
	722030	200		●	●								●	●			
	722035	250				●									●	●	●
	722040	500				●									●	●	●
	722045	1000				●										●	●
	722050	2000					●										
	722055	5000					●										

* Extended inaccuracy and imprecision of the pipettes with pre-sterilized A tips.

Electronic Pipettors

	Cat. No.	µl	Standard Tips A*	C 10	D 300	E 350	H 1000	J 1200	K 5000	10 000 Ext.	Filter Tips L 10	M 10 Ext.	N 20	O 120	P 200	Q 300	R 500	S 1000	T 1200	Special Tips G 1000 WB	Z 1200 Ext.
eLINE Single Channel	73002X	0.2-10	●								●	●									
	73004X	5-120		●	●									●							
	73006X	10-300			●											●					
	73008X	50-1000				●												●		●	
	73010X	100-5000						●													
8-Channel	73032X	0.2-10	●								●	●									
	73034X	5-120		●	●									●							
	73036X	10-300			●											●					
	73039X	50-1200					●												●		●
12-Channel	73042X	0.2-10	●								●	●									
	73044X	5-120		●	●									●							
	73046X	10-300			●											●					
	73049X	50-1200					●												●		●
Proline Single Channel	710520	0.2-10	●								●	●									
	710010	5-100		●										●							
	710030	10-250		●	●											●					
	710100	10-500				●											●			●	
	710020	50-1000				●												●		●	
	710040	50-1200					●												●		●
	710500	100-5000						●													
8-Channel	710200	0.2-10	●								●	●									
	710210	5-100		●	●									●	●	●					
	710220	25-250			●											●					
	710800	50-1200					●												●		●
12-Channel	710300	0.2-10	●								●	●									
	710310	5-100		●	●									●	●	●					
	710320	25-250			●											●					
	710810	50-1200					●												●		●
ePET Single Channel	71052XET	0.2-10	●								●	●									
	71001XET	5-100		●										●							
	71002XET	50-1000				●												●		●	
	71004XET	50-1200					●												●		●
	71050XET	100-5000						●													
8-Channel	71020XET	0.2-10	●								●	●									
	71021XET	5-100		●	●									●	●	●					
	71022XET	25-250			●											●					
	71080XET	50-1200					●												●		●
12-Channel	71030XET	0.2-10	●								●	●									
	71031XET	5-100		●	●									●	●	●					
	71032XET	25-250			●											●					
	71081XET	50-1200					●												●		●
Proline XL	71090X	0.1-25 ml						●	●												
Midi Plus	71093X	1-100 ml						●	●												

* Extended inaccuracy and imprecision of the pipettes with pre-sterilized A tips.

A unique innovation – preventing contamination

Meet the Safe-Cone Filters – a unique safety innovation introduced by Biohit. They offer an added advantage in preventing contamination of both the pipettor and the sample, thus prolonging the service life of the pipettor. Biohit Safe-Cone Filters act as an alternative barrier to provide added protection because the filter prevents liquids from entering the internal mechanism of the pipettor. Other safety improving products are the Biohit Proline Biocontrol Decontamination solution and pipettor stands. Cleanliness is safety, as we say in Biohit.

Biohit Safe-Cone Filters – an alternative to filter tips

Biohit Safe-Cone Filters

These unique and replaceable filters act as a final barrier to prevent any fluids and liquid vapours from reaching the internal components of the pipettor.

The ultimate pipettor protectors are available as Safe-Cone Standard and Safe-Cone Plus. It is recommended to use the Standard filter for general applications and the Plus filter for more demanding applications such as radioactive work, cell culture, bacterial and virological work and molecular biology. Standard filters can also be used for this type of work, but they need to be changed more frequently.

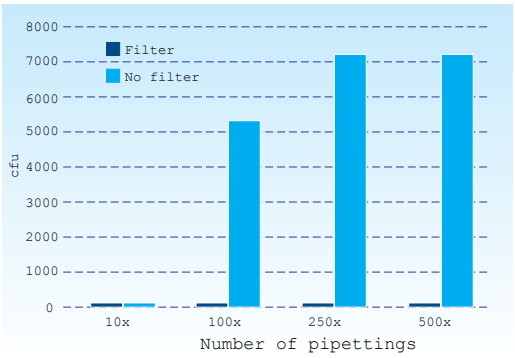
For more info, see literature on www.biohit.com and page 82.

The interval of changing the filter depends completely on the application and the sample. However, according to studies the filter is recommended to be changed daily (after 50 to 250 pipettings) and immediately in case of over-aspiration.

To ensure the safety of the user, forceps should be used to avoid touching the contaminated filters by hand. In addition, the tip cone should be cleaned regularly.

No. of Pipettings	No Filter	Safe-Cone Filter
50	-	-
100	+	-
250	++	-
500	+++	-

+: DNA (50 µl plasmid DNA 120 µg/ml) contamination in pipettor barrel.



Pipettor contamination in pipettor barrel when pipetting liquid culture of bacteria Micrococcus Luteus.

Safe-Cone Filters Biohit pipettor compatibility and ordering details

Cat. No.	Description	Qty/Unit	mLINE Proline Plus	Proline Mechanical	eLINE	Proline Electronic	ePET
721008	Standard ø 2.51 mm PE	50 Filters	725130, 725230, 725050	720080, 720020, 722010, 722015, 722020	730340, 730440, 730040		
721007	Standard ø 3.15 mm PE	50 Filters	725060, 725140, 725240	720050, 720070, 722025, 722030	730060, 730360, 730460		
721006	Standard ø 5.33 mm PE	50 Filters	725070	720060, 722035, 722040, 722045	730080, 730100, 730390, 730490	710100, 710020, 710040, 710500, 710800, 710810	71002XET, 71004XET, 71050XET, 71080XET, 71081XET
721005	Standard ø 6.73 mm PE	50 Filters	725080	720110, 722050, 722055			
721014	Standard ø 1.83 mm PP	50 Filters	725030	720120, 720130, 720220, 720240, 720320, 720340		710410, 710420, 710210, 710220, 710310, 710320	71021XET, 71022XET, 71031XET, 71032XET
721018	Plus ø 2.51 mm PE	50 Filters	725130, 725230, 725050	720080, 720020, 722010, 722015, 722020	730340, 730440, 730040		
721017	Plus ø 3.15 mm PE	50 Filters	725060, 725140, 725240	720050, 720070, 722025, 722030	730060, 730360, 730460		
721016	Plus ø 5.33 mm PE	50 Filters	725070	720060, 722035, 722040, 722045	730080, 730100, 730390, 730490	710100, 710020, 710040, 710500, 710800, 710810	71002XET, 71004XET, 71050XET, 71080XET, 71081XET
721015	Plus ø 6.73 mm PE	50 Filters	725080	720110, 722050, 722055			

PP=polypropylene
PE=polyethylene

BIOHIT
Innovating for Health

Biohit Proline® Biocontrol – decontamination solution

Biohit Proline Biocontrol is a safe, simple solution for decontamination in the laboratory. It is specifically designed for decontaminating laboratory instruments.

The components of the pipettor, which most often become contaminated, whether by incorrect pipetting techniques or by accident, are in the tip cone area.

Daily safety maintenance

Lightly spray the outside of the pipettor and wipe dry with a clean cloth. Clean surfaces, such as incubators and benches with no noticeable contamination such as blood stains may be dampened using the Proline Biocontrol, left on for 2 minutes and then wiped clean with an absorbent cloth.

Effective against:

• Viruses

Hepatitis A, B, C, D and E, HIV, Parvovirus, Newcastle Disease

• Bacteria

Pseudomonas sp., coli, Staph aureus, Proteus mirabilis, Proteus vulgaris, Streptococcus sp., Bacillus sp., Salmonellae, Klebsiella sp., Enterobacter sp., Serratia sp., Mycobacterium sp., Listeria sp., Legionella pneumophilia

• Fungi

A. Niger, Penicillium sp., T. Mentagrophytes, Candida albicans

Biohit Proline® Biocontrol is:

- Non-toxic and non-irritating to humans and animals
- Ready to use
- Lethal to a broad spectrum of viruses, bacteria and fungi
- BS 6471 Approved
- Non-corrosive to metals
- Non-fuming
- Odourless and non-staining
- Non-mutagenic
- Alcohol, aldehyde, phenol and chlorine free
- Effective at removing odours
- Environmentally friendly (biodegradable)
- Stable for long periods

Cat. No.	Qty/Unit	Pack Format
724004	5 litre	Economic Large Container

Pipettor Stands

When the pipettor is not in use, it should be stored in an upright position in order to avoid contamination from dirty benches. Biohit offers stands for all of its pipettors.

The stylish Biohit Linear Stand is designed for all Biohit mechanical and electronic pipettors, and especially for mLINE, Proline Plus, Proline mechanical and ePET electronic pipettors. The stand is also compatible with a wide range of other manufacturers' pipettors.

The compact Carousel stands are available in different models, both for storage only and for charging.

Cat. No.	Item
725600	Biohit Carousel Stand for 6 mechanical pipettors
725610	Biohit Pipettor Holder for one Proline Plus / mLINE pipettor
721000	Carousel Stand for 5 Proline mechanical pipettors
725620	Linear Stand for all Biohit pipettor models

Cat. No.	Item
73098X	eLINE Charging Stand for one pipettor
73099X	eLINE Charging Carousel for 4 pipettors
51000X	Proline Charging Stand for one pipettor
51160X	Proline Charging Carousel for 4 pipettors
710999	ePET Stand for one pipettor

X: 1 = With AC-adaptor, Euro; 2 = With AC-adaptor, U.S.; 3 = With AC-adaptor, U.K.; 4 = With AC-adaptor, Jpn; 5 = With AC-adaptor, Aus (only eLINE stands)

Reagent Vessel

The autoclavable and durable reagent vessel is made from polypropylene and is chemically resistant to all common reagents.

Cat. No.	Qty/Unit	Capacity
783500	16	120 ml

BIOHIT
Innovating for Health

Leading edge after-sales services by Biohit

Beside pipetting, laboratories must pay attention also to the quality and performance of the tools and equipment that are used in everyday work. To ensure the continuous accuracy and precision of your liquid handling instruments we offer a wide range of high quality services, such as quality control, repair services, preventive maintenance and calibration services. And, when doing it regularly, you'll keep your pipettor in good operating condition and also help extend its life-time.

Global network of trained distributors and certified service centers

We provide preventive maintenance, repair, calibration and accredited calibration services through our global subsidiary and distributor network:

1. Technically trained distributors

All Biohit distributors have been carefully trained to maintain and calibrate liquid handling devices manufactured by Biohit.

2. Biohit Certified Service Centers

Biohit Certified Service Centers (BCSC) are highly qualified for technical service and calibration. These service centres are authorised, trained and regularly audited by Biohit to offer you the highest quality of service. They have also been tested and approved to provide traceable calibration results by the Biohit accredited (FINAS) calibration laboratory. The Biohit Certified Service Centers maintain standard operating procedures for technical service and calibration, test equipment has been set up in accordance with ISO 8655 and the personnel have been carefully trained.

Please visit **www.biohit.com** for your nearest Biohit Certified Service Center.

3. Biohit Pipette Doctor Service

Biohit Pipette Doctor Service Centers have expertise to service and calibrate pipettes of all makes, all models, and all volumes.

Pipette Doctor is the ultimate level of pipettor service within Biohit's after-sales services and in the world. Pipette Doctors are high performance service centers that have deep technical knowledge and competence to service and calibrate more than 800 different pipettor models. Pipette Doctor service is very practical if you have also other than Biohit pipettors in your laboratory. Pipette Doctor professional can service and calibrate them all. Advantages are as follows:

- Professional one-stop pipettor service for all makes and models
- No need to send pipettors to many different locations
- Easy, simple and effortless service
- Cost savings through a single service contract for all makes and models
- Please visit **www.pipettedoctor.com** for your closest Pipette Doctor Service Center. If such a service does not exist in your area, please contact your Biohit distributor for further actions.

Through Biohit After-Sales Services you get

- High quality maintenance, repair and calibration services for all Biohit pipettors
- Good operating condition and extended life-time of the pipettors thanks to scheduled preventive maintenance programs and calibration services
- Cost savings with full spare part service with original spare parts for Biohit pipettors
- Time savings through convenient and cost-efficient service contracts, on-site services and fast turnaround times
- Detailed documentation on services performed

Biohit Preventive Maintenance and Repair Services

Liquid handling devices, such as pipettors, are precision instruments, that comprise a great variety of mechanical and electronic parts. These parts are naturally subject to wear and damage over time, for example:

- The piston surface can deteriorate, wear or corrode over time.
- Tip cones are subject to chemical corrosion and wear, especially in the tip sealing area.
- Batteries of electronic pipettors do not last forever and must be replaced regularly.

All these problems can be overcome by carrying out regular maintenance and calibration programs to ensure the functionality and performance (inaccuracy and imprecision) of the pipettor. According to extensive experience and research by Biohit, failure rates can be significantly reduced if a regular and scheduled preventive maintenance program is carried out on the pipettors. In addition, the pipettor life-time can easily be extended through regular service and replacement of critical components.

Biohit offers scheduled Preventive Maintenance Programs for service and calibration.

Biohit Preventive Maintenance Program

Procedure	Benefits	Suitable for
• Cleaning of the pipettor • Cleaning of the lower parts (ejector collars, piston, seal/o-ring, tip cone) • Replacement of the critical parts, so-called Preventive Maintenance Packages if needed • Re-greasing of the piston, seal or o-ring • Pressure leakage test • Calibration and performance testing according to the customer's requirements (please see table on page 64)	• Detailed service documentation: service report and calibration report • Improved pipettor reliability • Constant pipettor performance level (inaccuracy and imprecision) • Fewer failures due to unexpected malfunctions of the pipettor • Decreased pipettor downtime as a result of preventive maintenance packages • Longer lasting pipettors • Lower number of pipettors that fail pre-calibration • Less waste of time and money on exception reports	• Laboratories that have a strict quality system such as ISO 9001, ISO 17025, GLP or any other quality system imposed by local legislation, international standards or product/ service type. • Laboratories that need to prove quality of their services or products to their customers. • Laboratories following ISO 17025, - i.e. accredited laboratories • Laboratories that are working with accredited laboratories but which are not necessarily accredited themselves

Biohit Repair Service

Procedure	Benefits	Suitable for
• Troubleshooting of the problem • Disassembling the pipettor: all parts are inspected for damage and wear • Components are cleaned or replaced, whenever necessary • Re-greasing of the piston, seal or o-ring • Pressure leakage test • Calibration and performance testing according to the customer's requirements' (please see table on page 64)	• Detailed service documentation: service repair report and calibration report • Fully repaired and functional pipettor • Original spare parts	• Any customers with Biohit pipettors with damaged components or improper function and that need repair and calibration by qualified specialists

Biohit Maintenance by End-User & Full Spare Part Service

Procedure	Benefits	Suitable for
• Product and technical service training is provided to customers who want to service and test their own pipettes in-house. • Biohit provides so-called preventive maintenance packages that include the most frequently used components for pipettor service. • Your nearest Biohit distributor or Biohit Certified Service Center also provides the full range of original Biohit spare parts ensuring fast delivery. All spare parts are described and listed in instruction manuals and dedicated Technical Service Manuals.	• Knowledge for service and test pipettors in-house • Original spare parts • Cost-effective • Easy with preventive maintenance packages	• Customers who want to service and calibrate pipettors in-house: schools and universities, hospitals with technical maintenance departments etc. • Customers who do not require traceable calibration of international measurement standards

Service portfolio listed above and offered by Biohit After-Sales Service centres may differ country by country.
Please contact your local dealer for details.

For more information about Preventive Maintenance, Repair and Calibration services, please contact your local Biohit representative or go to www.biohit.com.

Note: Before sending any instruments to technical service, please ensure that they are **free from all contamination**. Please fill in decontamination certificate and advise our Service Centers of any hazardous materials which may have been used with your pipettor.

Calibration Services

The principles of Good Laboratory Practice (GLP) state that laboratory equipment should be periodically inspected, cleaned, maintained, and calibrated according to Standard Operating Procedures (SOP). Records of these activities should be maintained. Calibration should, where appropriate, be traceable to national or international standards of measurement.

Biohit is one of the few accredited pipettor calibration laboratories in the world today. To help you fulfil the GLP or quality system requirements such as ISO 9001 and ISO 17025 we offer you:

Basic Performance Testing (5.1)

Procedure	What you get	Suitable for
Basic checking of the inaccuracy and imprecision for the pipette: 5 readings measured at mid-volume (5x50%)	Performance Test Report	This is a good basic "performance check" for your pipettes and can be used for laboratories working to GLP.

Basic Calibration (5.2)

Procedure	What you get	Suitable for
Pipettor is tested for inaccuracy and imprecision and also for linearity: 5 readings measured at 10% of the maximum volume and maximum volume (5x100% and 5x10%)	Calibration Report detailing the inaccuracy and imprecision of each volume range tested	This calibration can be used if the pipettor is used over the whole volume range. This can be used for GLP and as an entry level calibration for GMP as well.

Enhanced Calibration (5.3)

Procedure	What you get	Suitable for
Pipettor is tested for inaccuracy, imprecision and linearity throughout its whole working range, including its mid-volume: 5 readings measured at its maximum, middle and 10% of the maximum volume (5x100%, 5x50% and 5x10%)	Calibration Report detailing the inaccuracy and imprecision of each volume range tested	This calibration can be used if the pipettor is used over the whole volume range. This is suitable for customers working to GMP or laboratories where a higher level of confidence is required.

ISO 8655 Level Calibration (10.3)

Procedure	What you get	Suitable for
Pipettor is tested for inaccuracy, imprecision and linearity throughout its whole working range, including its mid-volume: 10 readings measured at its maximum, middle and 10% of the maximum volume (10x100%, 10x50% and 10x10%)	ISO 8655 Level Calibration Report detailing the inaccuracy and imprecision of each volume range tested	10 readings at each volume ensure a high level of confidence. This is suitable for customers working to GMP or laboratories where a higher level of confidence is required.

Accredited Calibration

Procedure	What you get	Suitable for
Pipettor is tested for inaccuracy, imprecision and linearity to determine the uncertainties of measurement for each volume calibrated. Test volumes and data points are selected according to the customer requirements.	Accredited Calibration Certificate and uncertainty budget in accordance with ISO 17025. This is the highest level of calibration available.	Laboratories that are working with accredited laboratories or laboratories following ISO 17025, - i.e. accredited laboratories.

Additional Service Precalibration ("As Found" Performance Test)

Procedure	What you get	Suitable for
Testing of the pipettor prior to service and recalibration to establish how well the pipettor has been performing "as found". Same combination of data points as shown above.	Precalibration Report detailing the inaccuracy and imprecision of each volume range tested	Especially customers working to GMP

Calibration service portfolio listed above and offered by Biohit After-Sales Service centres may differ country by country.
Please contact your local dealer for details.
Please note: Test volumes 100%, 50% and 10% of the nominal volume are defined by ISO 8655:2002 standard and thus these volumes are also recommended by Biohit.

The frequency of the testing and calibration depends on

- Accuracy requirements of the application
- Frequency of use
- Number of operators using the pipettor
- Nature of the liquid dispensed
- Specifications established by the user
- Requirements from GLP or quality systems

mLINE and Proline Plus

Proline mechanical

Accredited Calibration Services

Nowadays, many laboratories are accredited and work to strict quality control guidelines and regulations. For this reason, the calibration of laboratories' instruments must be certified by an independent body that is competent and qualified to perform service and calibration activities. Biohit is one of the few internationally accredited (ISO 17025) pipettor calibration laboratories in the world. We offer you accredited calibration for both new and serviced Biohit pipettors.

Accredited Calibration Certificate (ISO 17025) for new and serviced Biohit pipettors

	What you get	Suitable for
Accredited Calibration Certificate (FINAS, ISO 17025) together with your • new • serviced Biohit pipettors.	Accredited Calibration Certificate supplied with your new or serviced Biohit pipettor includes the Uncertainty Budget defining the uncertainties for the measurement involved. As a result, you will know exactly what kind of uncertainty is due to the performance of the pipettor and what is due for example, to the uncertainty of the balance.	Laboratories that are working with accredited laboratories or laboratories following ISO 17025, – i.e. accredited laboratories. Ask for an additional Accredited Calibration Certificate from your nearest dealer next time you order a new pipettor from Biohit. Price varies depending on pipettor model.

Accredited calibration service for serviced pipettors is also available at Biohit UK (UKAS) and Biohit France (COFRAC).

An Accredited Calibration Certificate means that

- Measurements are traceable to national and international standards
- Calibration has been carried out to the highest standards
- Agreed and specified methods and procedures have been followed
- The Biohit laboratory issuing the certificate has been assessed by independent experts

ilac-MRA FINAS Finnish Accreditation Service K041 (EN ISO/IEC 17025)

cofrac ETALONNAGE 2-1513

UKAS CALIBRATION 0698

BIOHIT UNCERTAINTY BUDGET

BIOHIT

Balance: Sartorius MC5, serial 11305654
Pipettor: Biohit Proline 50 - 200 µl, serial AQ30836

Parameter		Interval +/-		Distribution	Standard uncertainty		Sensitivity coefficient		50 µl c*u(x)	
balance	uncertainty	8	µg	rectangular	4,62	µg	1	nl/µg	4,62	nl
	linearity	4	µg	rectangular	2,31	µg	1	nl/µg	2,31	nl
1st value	reproducibility	1	µg	rectangular	0,58	µg	1	nl/µg	0,58	nl
2nd value	reproducibility	1	µg	rectangular	0,58	µg	1	nl/µg	0,58	nl
1st value	resolution	1	µg	rectangular	0,58	µg	1	nl/µg	0,58	nl
2nd value	resolution	1	µg	rectangular	0,58	µg	1	nl/µg	0,58	nl
	temperature drift	1,00E-06	K-1	rectangular	5,77E-07	µg	1	nl/µg	5,77E-07	nl
water	temperature	0,1	K	rectangular	0,06	K	10	nl/K	0,58	nl
air	temperature	0,1	K	rectangular	0,06	K	-0,23	nl/K	-0,01	nl
	pressure	10	hPa	rectangular	5,77	hPa	0,06	nl/hPa	0,34	nl
	relative humidity	10	%	rectangular	5,77	%	-0,01	nl/%	-0,03	nl
delivering device	cubic expansion coefficient	9,00E-05	K-1	rectangular	5,20E-05	K-1	-1,00E+05	nl*K	-5,20	nl
	temperature	2	K	rectangular	1,15	K	-4,5	nl/K	-5,20	nl
standard uncertainty associated with the volume V20 measured with the gravimetric measuring system									9	nl
precision on the calibration									63	nl
standard uncertainty of the calibration									**64**	**nl**

BIOHIT
Innovating for Health

Pipette Service and Calibration Software – Quanta

As a leading designer and manufacturer of liquid handling products, Biohit recognises the need to provide anyone who needs to check and calibrate pipettes, from end users to pipette service companies, with a range of software to ensure the ongoing performance of their pipettes. The Quanta range of software has been designed to offer a tailor-made solution whatever your requirement for calibration and pipette service software.

Quality control in labs – why you need to do it

Instruments and equipment used within a laboratory need to be routinely tested, validated and calibrated by laboratory personnel or an external technically competent and authorized calibration company.

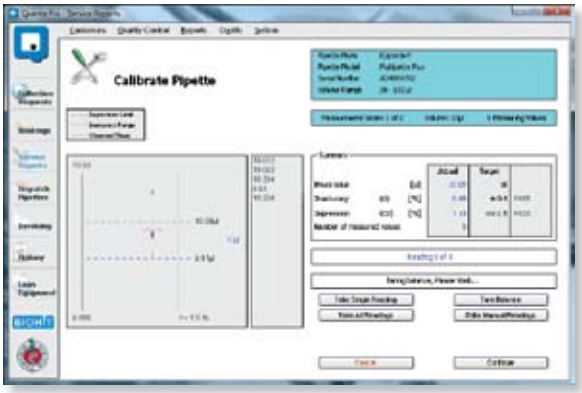
Regularly checking the performance of your pipettes is vital to ensure the ongoing quality of your results. End users may not know that they are dispensing inaccurate or imprecise volumes of liquid which in turn could lead to incorrect results. The more frequently you test and calibrate your pipette, the sooner you would detect these inaccuracies and imprecisions This will maintain the integrity of your laboratory data and reduce the likelihood of having to repeat your work.

More about different calibration levels on page 64.

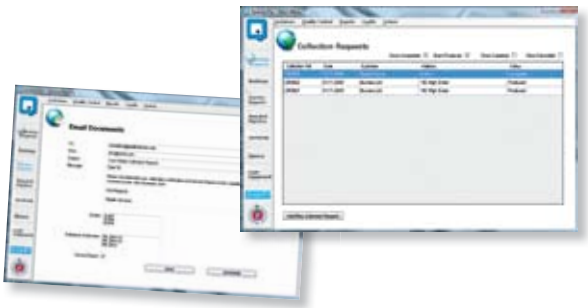
> "Apparatus used in a study should be periodically inspected, cleaned, maintained, and calibrated according to Standard Operating Procedures (SOP). Records of these activities should be maintained. Calibration should, where appropriate, be traceable to national or international standards of measurement."
>
> (GLP, Good Laboratory Practice),

Quanta range of software

Biohit provides anyone who needs to check and calibrate pipettes, from end users to pipette service companies, with a range of software to ensure the ongoing performance of their pipettes. Quanta schedules pipette calibrations, controls and captures data from balances automatically, performs all required calculations and produces reports such calibration reports, service reports, overdue pipettors reports etc. Quanta software is suitable for both single and multi-channel pipettes of fixed and variable volume, manual and automatic dispensers, burettes, dilutors and volumetric glassware.



User-friendly and clear calibration interface



The suite of Quanta software:

- Meets ISO 8655, DIN 12650, ISO 9000, ISO 17025 and GLP requirements
- Can be used with your current calibration protocols
- Connects to any balance supporting RS232 interface; controls and collects calibration data automatically from the balance
- Converts automatically mass into volume by using temperature and barometric pressure
- Provides automatic calculations on inaccuracy and imprecision
- Produces calibration reports and optional reports automatically
- Includes a database of 1500 pre-loaded test plans for all major manufacturers pipettes and liquid handling instruments
- Provides calibration specifications in accordance with manufacturers specifications, ISO 8655:2002 maximum permissible errors or user-defined specifications
- Allows you to service your pipettes via the software, recording exactly what has been done to the pipette, what has been fitted in the way of spares, what has been the cost of maintenance etc.
- Maintains a complete service and calibration history which can be accessed easily
- Provides full audit trail on service and calibration measures - who, what, when and why
- Provides user assistance online (www.quantapro.net), user wizard and user manual.
- Can be customized to your needs.

BIOHIT
Innovating for Health

Modular structure – Quanta offers you what you need, not what you are given!

The suite of Quanta software has been designed to offer a tailor-made solution whatever your requirement for service and calibration software. The software has been developed in a modular way, enabling you to choose the options that you require to calibrate your pipettes. Our standard tailored modules are as follows:

QuantaCal – Our entry level software. QuantaCal is designed primarily for the end user that simply needs to maintain a database of their pipettes, to be able check them against the manufactures specification, ISO8655 or end user specification and to produce a detailed calibration report that will satisfy general GLP/GMP requirements.

quantaCal
Pipette calibration software
for the professional laboratory

QuantaLab – Our midrange software. QuantaLab is a unique menu based software system, incorporating QuantaCal as its base module and seven additional options (see table) that enables you to control whole service and calibration process and is ideally suited to the smaller service company or organisation that tests and maintains their own pipettes in-house.

quantaLab
Pipette service and calibration software
for the professional laboratory

QuantaPro – The most comprehensive service and calibration software on the market. Developed for the professional high output pipette service companies or large multi-site end user accounts, it can develop all aspects of the service process from receipt to dispatch.

quantaPro
Pipette service and calibration software
for the professional engineer

Quanta Software Modules:

FEATURES	QuantaCal	QuantaLab	QuantaPro
Add/Edit Pipettes	√	√	√
Personalised Information	√	√	√
RS232 Balance Support	√	√	√
Calibrate Pipettes	√	√	√
Add/Edit Test Plans	√	√	√
Multiple Departments	√	√	√
Calibration Reports	√	√	√
Multiple Customer Entry	Optional	√	√
Booking In/Dispatch System	Optional	√	√
Pipette Collection Requests *	Optional	√	√
Service Module	Optional	√	√
Spare Part Management **	Optional	√	√
Due/Overdue Pipettes Report	Optional	√	√
Service/Calibration Recall	Optional	√	√
Email System	Optional	Optional	√
Quality Control	Optional	Optional	√
Report Editor	Optional	Optional	√
Management Reporting	Optional	Optional	√
Demo Equipment Management	Optional	Optional	√
Quote Generator	Optional	Optional	Optional
Mettler Multichannel Support	Optional	Optional	Optional
Accredited Certificates (ISO17025)	Optional	Optional	Optional
Multi-language Output	Optional	Optional	Optional

*Pipette Collection Request is a sub-module of the Booking in/Dispatch system. The Booking/Dispatch system has to be in place before installing Pipette Collection request. **Spare Parts Management is a sub-module of the Service Module. The Service Module has to be in place before installing Spare Parts Management

Please visit www.quantapro.net for further information on optional modules.

Ordering Details

CAT. NO.	ITEM	WHAT	SUITABLE FOR
770020	QuantaCal	Basic module of QuantaCal (see table on page 68)	End users and small service companies who wish to simply check pipettes on a regular basis
760005	QuantaLab	Basic module of QuantaLab (see table on page 68)	End users and small/mid size service companies that need to have full control of service and calibration process
760002	QuantaPro	Basic module of QuantaPro (see table on page 68)	High output service companies and demanding end users that require versatility from service and calibration software
770040	Validation package for Quanta Software	Installation, Operational and Performance Qualification documents (IQ, OQ and PQ)	Anyone who needs to validate calibration set up in accordance with prevailing standards
N/A	For upgrades, optional modules and related catalogue numbers please see **www.quantapro.net**	Upgrade your software to your requirements	

How to order?

- Please contact your local Biohit representative for ordering information or
- Log on to **www.quantapro.net** and complete a contact form which will be forwarded to your nearest Biohit representative or
- Log on to **www.quantapro.net**, complete an online ordering form and purchase the software with a credit card

Evalution Version

Please download evaluation version from www.quantapro.net or request a dvd from your Biohit representative. Evaluation version allows for storing information on and calibrating 25 pipettes.

Recommended System Requirements

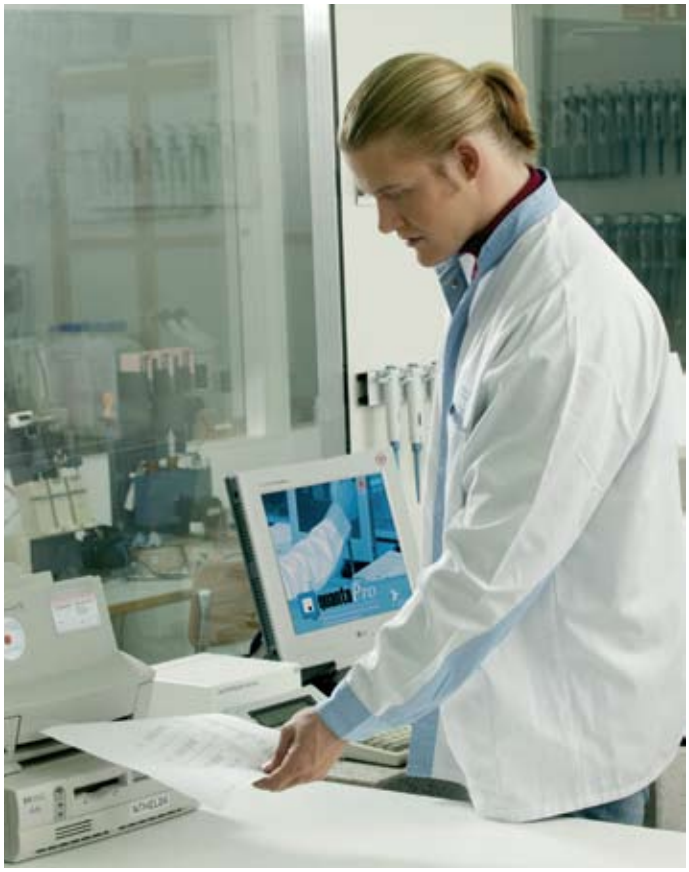
- 2GHz Pentium P4 Processor
- Windows: 2000/XP/Vista/Vista 64
- 256Mb RAM
- 100Mb Free Disk Space

Online Support and Additional Information

Please visit **www.quantapro.net** for technical support and further information

Availability

Q2/2008



Quanta software produces individual calibration reports on each pipettor tested

Quanta software, developed by a professional pipettor and service company, is truly the most comprehensive pipette service and calibration package available today.

ilac-MRA FINAS Finnish Accreditation Service K041 (EN ISO/IEC 17025)

The accredited calibration laboratory of Biohit Oyj

- Assessed against the international ISO 17025 standard
- Accredited by FINAS since year 2000
- FINAS registration number K041/A04/2003
- Still one of the few internationally accredited pipettor calibration laboratories in the world (FINAS, COFRAC and UKAS)

FINAS – the Finnish Accreditation Service

- Operates under the Centre for Metrology and Accreditation
- National accreditation body under the Ministry of Trade and Industry
- Meets the requirements stated by GLP
- Member of the European Cooperation for Accreditation (EA) and one of the signatories of all existing European Multilateral Agreements (MLAs)

Terms & Definitions

PREVENTIVE MAINTENANCE

Preventive maintenance means renewing or replacing critical parts of a device on a regular basis to prevent malfunctions. In other words, preventive maintenance is about maintaining equipment in good operating condition. There is no point in waiting for the pipettor to fail.

PERFORMANCE TESTING

It is important to understand the difference between calibration and performance testing. Performance testing is often thought to be calibration, which is not the case. Performance testing is the verification procedure for the pipettor using a gravimetric, photometric or other test method. Performance test is carried out to check that the calibration of the pipettor is correct. In other words, the balance reading converted into volume should be in accordance with the selected volume in the display. If the results are incorrect, the pipettor will be calibrated and tested again.

CALIBRATION

According to ISO 8655-1(2002), "calibration is a set of operations that establish the relationship between the dispensed volume and the corresponding nominal or selected volume of the pipettor." In other words, calibration is the adjustment of the pipettor to give the selected volume. In practice, the length of the piston movement is adjusted so that the balance reading is in accordance with the selected volume on the display. Every pipetting operation is only as accurate as the calibration of the pipettor used.

ACCREDITED CALIBRATION

The difference between traditional calibration and accredited calibration is that an accredited calibration service can differentiate between uncertainties of the pipettor and uncertainties of the measuring process. As a result, an accredited calibration service is technically competent to release a calibration certificate where the uncertainties for the measurement involved are listed. Thereby, the customer knows exactly what uncertainty is due to the performance of the pipettor and what is due, for example, to the uncertainty of the balance used. Accredited calibration means that a customer can have full confidence in the technical competence of the body that carries out the calibration according to international standards.

ISO 17025 AND ISO 9001

ISO 9001 is a documentation of an organization's quality management system and, as such, tells very little about its competence to provide accurate and reliable test data. Nowadays, ISO 9001 is a must. However, if quality management is to be measured to determine the technical competence for the performance of testing and calibration, laboratory accreditation is also required. Calibration and testing laboratories, certification bodies and inspection bodies are accredited. The technical competence of these notified bodies is assessed against the European EN 45000 and international ISO 17000 Standards and respective ISO/IEC Guides. ISO 17025 is defined as "General Requirements for the Competence of Testing and Calibration Laboratories."

ISO 8655

ISO 8655 is a new international standard for "piston operated volumetric apparatus". ISO 8655 defines, among other things, terms and definitions regarding piston operated pipettors and their testing, requirements for test equipment and test conditions, testing procedure and maximum permissible systematic and random errors for pipettors (inaccuracy and imprecision). Biohit follows ISO 8655 and takes its requirements into account in its research and development, production, quality assurance and after sales service.

GOOD LABORATORY PRACTICE, GLP

The Good Laboratory Practice (GLP) principles were created by OECD (www.oecd.org) to internationally harmonize test methods and laboratory practices. Today "GLP compliance" is one of the key indicators of high quality laboratory services. According to the GLP, "Apparatus used in a study should be periodically inspected, cleaned, maintained, and calibrated according to Standard Operating Procedures (SOP). Records of these activities should be maintained. Calibration should, where appropriate, be traceable to national or international standards of measurement."

For more information, see **www.biohit.com**.

Innovating for Health

BIOHIT
Innovating for Health

"Biohit mLINE had the lightest weight of the pipettes of similar volume, was one of the shortest in length, fit both the small and large hand the best, was the easiest to read, was the easiest to adjust the volume, and for the volume we looked at had the lowest force requirements for both plunger depression and tip ejection"

Joan Erickson, MOTR/L
Ergonomics Consultant
in a comparison study

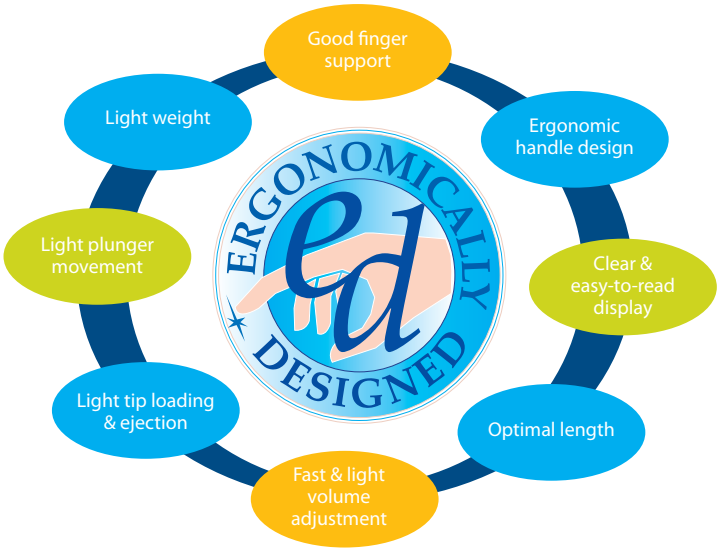
A pioneer in ergonomic design - Biohit

Working with pipettors is much more than just pressing the thumb. This is why ergonomics has been one of Biohit's main concerns in product development for over 15 years. Thanks to the company's research and development, Biohit is able to offer the most ergonomic and user-friendly liquid handling products available today.

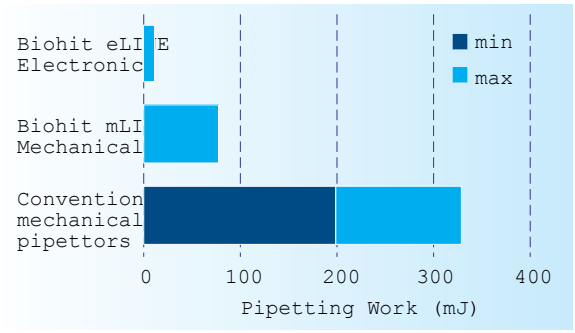
Did you know that...?

- Pipetting over 1.5 h/day (300 h/year) exposes to RSI (Repetitive Strain Injury).
- Lab professionals have twice as much WRULD (Work Related Upper Limb Disorder) as employees in general.
- 44 % of lab professionals suffer from disorders caused by pipetting.
- Pressing the plunger button as well as ejecting tips with a conventional mechanical pipettor together require a force up to 70 N (7 kg), which corresponds to the force required to lift 2 house bricks or 7 litres of milk.

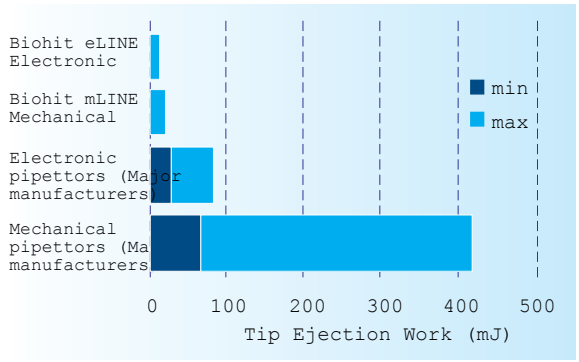
Follow the signs of the ergonomic pipettor



mLINE and eLINE offer the lightest and most ergonomic pipetting operations on the market.



Comparison of pipetting work with electronic and mechanical pipettors



Both the tip ejection force and the distance thumb has to travel to eject the tips have been measured.

mLINE®
Mechanical Pipettors

– effortless accuracy

- Light weight for easy liquid handling
- The lightest pipetting force on the market
- Tip loading and ejection require only minimum force (Optiload)
- Both left and right handed operation
- Consistent results time after time

For easy and ergonomic manual pipetting, your first choice should be mLINE – as recommended by Health & Safety Officers of leading pharmaceutical companies.

Pay also attention to:

- Weight and design of the pipettor
- Your seating position
- Rest intervals
- Bench layout & lighting
- Number of repeated pipetting series

eLINE®
Electronic Pipettors

– leader in performance & ergonomics

- Fully electronic pipetting operations
- Multi-function device – a lot more pipetting modes than in a mechanical pipettor
- Less stages means time-savings especially in multi-dispensing (twice as fast as a mechanical pipettor)
- 30 times lighter pipetting than with a mechanical pipettor
- Unique electronic one touch tip ejection
- Both left and right handed operation
- User independent accuracy and precision

When you need to pipette and dispense liquids as comfortably as possible, your first choice should be eLINE. This Award Winning pipettor enables you to focus on your work instead of worrying about Repetitive Strain Injury.

Safety in pipetting

Pipetting with air displacement pipettors is one of the most common laboratory tasks and includes a number of potential risks. The risks can be divided into three defined areas:

1. Physical risk through stress (ergonomics)
2. Situations where the user is at risk of contamination through handling of infectious or toxic agents
3. Situations where the sample or specimen is at risk through contamination from other samples or environmental factors.

Cleanliness is safety - protect your pipettor and your sample from contamination

The user is often well protected by appropriate working benches, seats, clothing and shields, but the pipettor is forgotten. Modern air displacement pipettors with disposable tips enable fast and accurate pipetting, but contamination of the pipettors may increase both the possibility of unreliable results and health risks in laboratory work.

Organic and inorganic contamination can create problems for the scientist. No matter whether the particles are viral, bacterial ribonucleases or metal elements, in the testing environment they may lead to erroneous results. It is the reduction in the numbers of these particles and avoidance of cross contamination or accidental addition to the sample or the equipment being used that needs attention.

Corrosion of the pipettor piston is another threat. The number of corroded pistons that are replaced at service centres every day, and pipettors with totally contaminated inner parts is surprisingly high (see Figures A & C).

Finally, to ensure the safety, the laboratory worker should also pay attention to the ergonomics at work (pipettor and environment), take care of the proper shielding and protection (gloves, clothes) and follow good laboratory practice by pipetting slowly and carefully to minimise aerosol formation and foaming.

Literature on **www.biohit.com** and page 82.

Biohit safety features include

- Ergonomic pipettor design for improved occupational health
- Accurate and precise results with the appropriate tools
- Cleanliness through Safe-Cone Filters, certified tips, autoclavable pipettors and decontamination tools
- Appropriate storage with a wide range of pipettors stands
- High-quality after-sales services & accredited calibration

Fig A. Biohit mLINE features a unique tip cone filter ejection mechanism.

Fig B. The tip cone filter can be changed easily and safely with the use of forceps supplied with every Biohit pipettor.

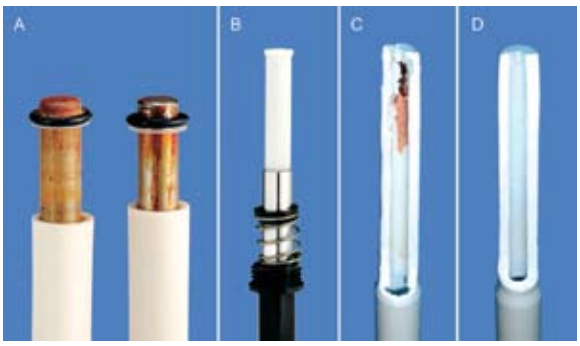


Fig A: Badly corroded and contaminated piston assemblies taken from a commonly used pipettor

Fig B: Biohit pipettor tip cone used with Biohit Safe-Cone Filter

Fig C: Tip cone taken from a commonly used brand of pipettor after over-aspiration of blood-sample

Fig D: Clean tip cone

Consistent results

One of the most common activities of laboratory workers is primary sample or reagent addition whilst performing a test. Some laboratory workers perform thousands of tests daily. There are a number of factors that influence the pipetting performance. For example, the quality of the products and tips, human error, pipetting techniques, and strain, as well as other factors, such as environment (temperature, air pressure, humidity), type of sample and type of application.

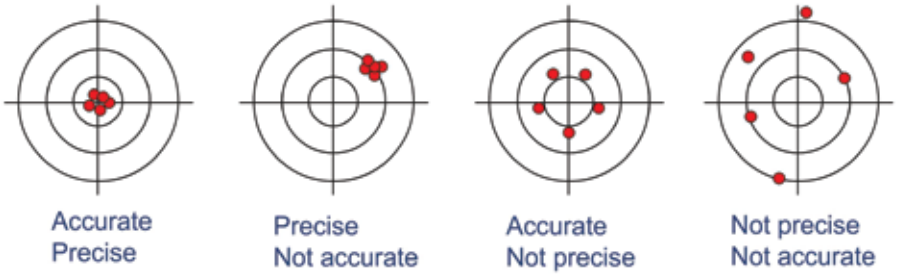
The most difficult demand for accurate and precise pipetting results is the consistent handling and continual depression of the plunger on pipettors.

Accuracy

It is possible to be very consistent, but consistently wrong. Inaccuracy is the numerical difference between the mean of a set of replicate measurements and the true value. High accuracy, i.e., small inaccuracy means very little difference between the mean sample and the true value. Accuracy is achieved by careful calibration of a precise instrument.

Precision

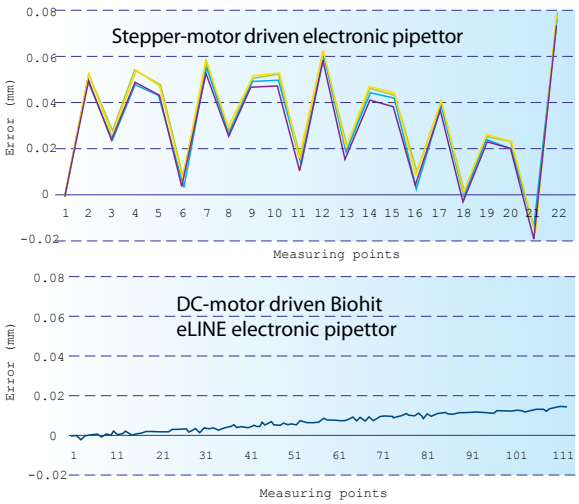
Precision is an agreement between replicate measurements. Precision has no numerical value, it is quantified by imprecision. High precision, i.e., small imprecision means very little variation between repeated measurements on the same sample. To achieve it a precision instrument is required, but also good laboratory practice must be followed.



Ten times more precise dispensing with Biohit electronic pipettors – unbeatable linearity

When comparing the stepper motor technology and the DC-motor technology for accuracy and precision, the dispensing (d) mode is the best choice.

The DC-motor driven Biohit eLINE and a stepper motor driven pipettor were tested for linearity in the d-mode. The measurement was done 5 times. The DC-motor driven Biohit electronic pipettor allows linear movement, - i.e. precise dispensing. The tested stepper motor pipettor generated a linear movement error, which is equal to over ± 1.5 µl. This even exceeds the minimum adjustable increment of the pipettors. In the d-mode, where even dosing is important, this kind of an error is significant.

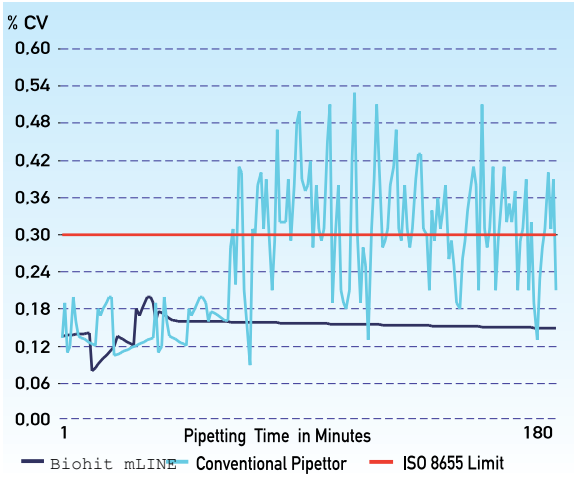


20 x 50 µl linearity measurement in d-mode.

Consistent results time after time with Biohit mechanical mLINE pipettors

Performance test of Biohit mLINE (violet line) and a conventional pipettor (blue line). Pipettors were tested over a 5-hour period with sets of 5 repeat weighings of 500 microlitres 180 times. The same trained operator was used. As shown, it is very hard to meet the specifications (red line, ISO 8655-2) with a force demanding pipettor after prolonged pipetting hours, whereas the light action of mLINE allows the same reproducibility over the whole period.

Literature on www.biohit.com and page 82.



Choosing the right pipettor

Mechanical Pipettor Selection Guide			
Functions	mLINE®	Proline Plus®	Proline®
Fully autoclavable	x	x	
Optiload	All models	Multi channels only	
Safe-Cone filters	x	x	x
Filter ejector	x		
Thermal insulation	x	x	
Volume locking	x	click stops	click stops
Pipetting force *2	12 N	15 N	20 N
Weight *2	77 g	82 g	84 g
Colour coding on display	x	x	
Colour coding caps	x		x*1
ID tags	x		
Biohit 6 place carousel stand	x	x	x
Proline 5 place carousel stand			x
Biohit Linear stand	x	x	x
Pipettor holder	x	x*1	x
Warranty	3 years	3 years	3 years
CE / IVD marked	x	x	x
Starter Kits available	x	x	

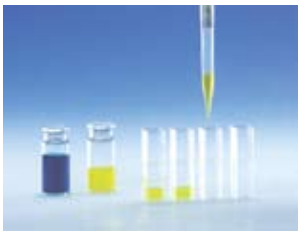
*1 Available as accessories
*2 1000 µl / 1- channel model

Electronic Pipettor Selection Guide			
Functions	ePET®	Proline®	eLINE®
(P) Pipetting	x	x	x
(d) Multiple Dispensing	x	x	x
(dd) Diluting[1]	x	x	x
(rP) Reverse Pipetting		x	x
(Sd) Sequenced Dispensing[3]		x	x
(Pm) Manual Pipetting[4]			x
(Ad) Automated Dispensing			x
(SA) Multi-Aspirating[5]		x	x
Custom Programmability			x
Post Delivery Mixing	x	x	x
Speed Selection	5 speeds	5 speeds	9 speeds
Manual Tip Ejection	x	x	
Electronic Tip Ejection			x
Autoclavable lower part[6]			x
AC/DC Charging Adapter	Included		Optional
Charging Stand (Holds 1 pipettor)		x	x
Charging Carousel (Holds 4 pipettors)		x	x
Linear stand	x		x
Warranty	2 years	2 years	2 years
CE / IVD marked	x	x	x

Notes: * Except multichannel 1200 µl.
1 (dd) Available on all models exept the 1200 µl multichannel Proline,
2 (rP) Available on all models exept the 1200 and 5000 µl Proline el.,
3 (Sd) Only on the 1200 and 5000 µl Proline el. and all eLINEs,
4 (Pm) Available in 1-ch eLINE only,
5 (SA) Only on the 1200 µl Proline el. and all eLINEs.
6 Charging stand for Proline el. and eLINE.
7 mLINE, eLINE, Proline mech., Proline elec. multichannels and ePET multichannels: all models > 10 µl; Proline and ePET elec. 1-ch. models >250 µl.
8 For storage, not charging.

Pipetting modes for Biohit electronic pipettors

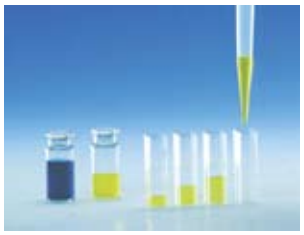
Pipetting (P)



Automatic blow-out

Pipette a selected volume with automatic blow-out with complete control of the piston movement. Post-delivery mixing may be used in conjunction with this mode.

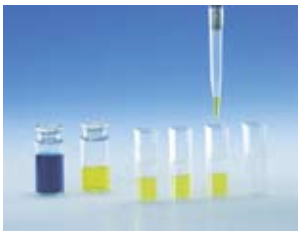
Sequential Dispensing (Sd)



Program up to 12 aliquot volumes per aspiration

A series of different volumes can be delivered in any desired order. An extremely beneficial feature when performing dilution series.

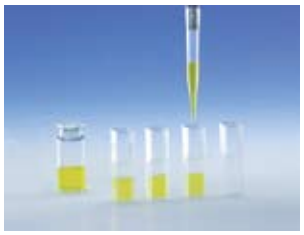
Reverse Pipetting (rP)



Optimises performance when pipetting viscous or biological fluids

A selected volume plus an excess is aspirated into the tip. After delivery the excess volume remains in the tip and is discarded.

Automatic Dispensing (Ad)



Efficient automatic dispensing with user-defined pace control

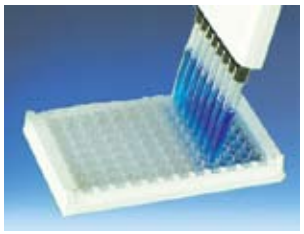
This mode is similar to the multiple dispensing mode but has the additional benefit of the dispensing cycles being under automatic control at a user specified pace (0.1 – 9.9 seconds).

Multiple Dispensing (d)

Quickly dispenses equal volumes

Aspirate the total volume plus an excess and repetitively dispense equal volumes of liquid. The volume and number of remaining aliquots are shown on the display.

Multi-Aspirating (SA)



Manual method for washing microplate strips

Select the volume and the number of aspirations until the series is completed, then discard the full aspirated volume in a single step.

Diluting (dd)

Dilution ratios 1:2 to 1:50

Two different solutions separated by an air gap are aspirated and then dispensed together with automatic blow-out. This mode may be used also in conjunction with post-delivery mixing.

Post Delivery Mixing (* or + Mixing)

User controlled mixing time

The piston is automatically moved up and down to mix the liquid in the delivery vessel. The mixing time is controlled by the start button. The mixing function is available in the pipetting or diluting modes (P, dd).

Pipetting preparations

- Use the tip specified by the manufacturer.
- Ensure that the pipettor and tip have been tested according to ISO 8655 and the tip is seated correctly.
- Make sure pipettors have been correctly calibrated.
- Check the pipettor, tip and liquid are all at the same temperature.
- When pipetting liquids with temperatures different to the ambient temperature, do not pre-rinse the tip. Change the tip after each pipetting.
- Ensure that any fluid viscosity variations have been accounted for and the correct technique is employed, i.e. reverse pipetting.
- If handling infectious or radioactive agents make sure appropriate shielding and other precautions protect the operator. For information on safety accessories see pages 56–58.
- Use Safe-Cone Filter in the tip cone when possible.

Pipetting action

- Hold the pipettor in a vertical position. Tilting the pipettor at an angle causes a volume greater than the set volume of liquid to enter the tip.
- Pre-rinse of tip is always recommended.
- When aspirating fluid the pipettor tip should normally be immersed to a depth of 2-3 mm.
- When using a mechanical pipettor, operate piston with a smooth and consistent thumb action for repeated results without foaming or bubbles.
- It is recommended to pipette against the inside wall of the receiving vessel. Remove the tip by drawing it up against the inside wall.
- Ensure the pipettor blow out action is fully activated.
- Ensure the volume is still set at the required position. Pipettor with volume locking mechanism is recommended to avoid accidental volume change during pipetting.
- Avoid leaving the pipettor on its side with liquid in the tip, which might seep back into the mechanism.

Other cautions

- Rack the pipettor when not in use – see product pages for more information on pipettor stands. Electronic pipettors should be returned to their charging stands.
- Avoid dropping the pipettor or allowing contact with dirt or grease.
- Change the Safe-Cone Filter regularly (recommendation after 50 to 250 pipetting cycles) and always in case of over-aspiration.
- Never strike the tip cone against the tip tray when loading the tip as this can damage the pipettor.
- Avoid exposing the unit to extreme temperature changes, humidity and dust (operating temperature from 15°C to 40°C).
- Service the pipettor regurarly.
- Clean the pipettor thoroughly before sending to service. Decontaminating the pipettor with Biohit Proline Biocontrol is a suitable procedure. Notify the service personnel for what purpose the instrument has been used. Postal services can refuse to deliver instruments used with hazardous materials. Make sure that a qualified person services the pipettor.

Pipettor decontamination procedure

Mechanical pipettors (mLINE + Proline Plus)

1. Unscrew the tip ejector collar counterclockwise and remove it.

2. Unscrew the tip cone holder counterclockwise and carefully remove it with the tip cone. Remove the Safe-Cone Filter if fitted.

3. Unscrew the piston counterclockwise from the pipettor.

4. Place the tip ejector collar, tip cone holder, tip cone and tip cone cylinder into a beaker containing Biohit Proline Biocontrol and leave for at least 30 minutes.

5. After performing the procedure described above, remove the components from the beaker and rinse them with distilled water, then dry preferably with warm air, for at least an hour.

6. Re-grease the piston as described in the instruction manual. Replace all components including new filter if fitted.

Electronic pipettors (eLINE)

1. Unscrew the tip ejector collar counterclockwise and remove it.

2. Unscrew the tip cone holder counterclockwise and carefully remove the tip cone holder, tip cone and spring. Remove the Safe-Cone Filter if fitted.

3. Unscrew the piston counterclockwise from the pipettor.

4. Place the tip cone, tip cone holder, tip ejector collar, piston and spring into a beaker containing Biohit Proline Biocontrol and leave for at least 30 minutes.

5. After performing the procedure described above, remove the components from the beaker and rinse them with distilled water, then dry preferably with warm air, for at least an hour.

6. Re-grease the piston as described in the instruction manual. Replace all components including new filter if fitted.

Note: When performing the decontamination procedure as a matter of routine, the o-ring seal should be checked for possible wear at every sixth instance, and replaced if necessary. The calibration should also be checked at the same time.

Autoclaving instructions

mLINE & Proline Plus mechanical pipettors

The entire mLINE and Proline Plus mechanical pipettor can be steam sterilized by autoclaving at 121°C (252°F), 1 bar (15 p.s.i.) for 20 minutes. The dispensing head of the multichannel pipettors must be unscrewed 360° counterclockwise before autoclaving.

- Remove the Safe-Cone Filter (if fitted).
- Put the pipettor into the sterilization bag and place it into the autoclave.
- After autoclaving the pipettor must be cooled down and left to dry overnight before use.

It is recommended to check the performance of the pipettor after every autoclaving, and to grease the piston/seal of the pipettor after every 10th autoclaving.

Tips and tip boxes

- Place the bulk tips into the sterilization bag and the tip tray as such in the autoclave.
- Autoclave for 20 minutes at a temperature of 121°C under 1 bar (15 p.s.i.).
- Cool down before use.

eLINE electronic pipettor, lower part

The dispensing head (tip ejector collar, tip cone holder, tip cone, spring and piston) of the single-channel and multichannel models (except for multichannel 1200µl) can be autoclaved (121°C, 1 bar for 20 minutes). These parts can be autoclaved as one unit or separately as individual parts. It is also possible to clean the parts and grease the piston prior to autoclaving.

- Remove the Safe-Cone Filter (if fitted).
- Put the dispensing head into the sterilization bag and place it into the autoclave.
- After autoclaving the parts must be cooled down and left to dry before use.

It is recommended to check the performance of the pipettor after every autoclaving, and to grease the piston/seal of the pipettor after every 10th autoclaving.

Note:

- Excessive heat or length of time can damage the products. Never put handle part of the eLINE into the autoclave.
- Lower ends of multichannel pipettors are not interchangeable between 8- and 12-channel pipettors.
- The cover of the tray should be closed during autoclaving.

Troubleshooting guide

Problem	Cause	Solution
Pipettor performance outside given specs	• Unsuitable tip	• Test with original manufacturer´s tip
	• Non-standard test conditions or calibration altered	• Perform test according to the ISO 8655 standard and recalibrate if necessary
	• Pipettor has not been maintained regularly	• Perform routine user maintenance and retest
	• Dirty Safe-Cone Filter	• Change Safe-Cone Filter
	• Pipettor is leaking	• See instructions below
Pipettor is leaking	• Unsuitable tip	• Use original manufacturer´s tip
	• Tip incorrectly attached	• Attach tip firmly
	• Worn or dirty tip cone	• Clean tip cone • Change tip cone
	• Worn or dried piston sealing	• Clean and re-grease o-ring • Change the o-ring
	• Instrument damaged	• Send for Service
Operating button jammed or moves erratically	• Liquid has penetrated tip cone and dried inside	• Clean and grease the piston/seal and the tip cone
	• Safe-Cone filter has been contaminated	• Change Safe-Cone Filter
	• Insufficiant amount of grease on a piston and seal	• Grease accordingly
Pipettor blocked, aspirated volume too small	• Liquid penetrated tip cone and dried	• Clean and regrease o-ring and piston and clean tip cone
Tip ejector jammed or moves erratically	• Tip cone and/or ejector collar contaminated	• Clean with soft cloth and mild detergent, Biohit Proline Biocontrol or 70% ethanol

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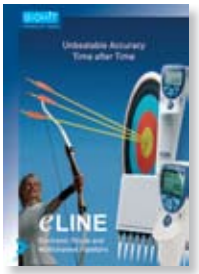
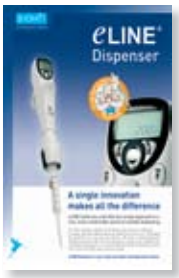
Brochures

Liquid Handling





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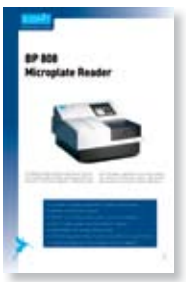

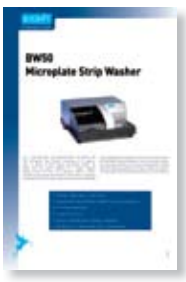

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20 YEARS
Biohit Anniversary

About Biohit

Biohit was founded 20 years ago, in 1988. The background of the company, however, stretches back to the 1970s, when Professor Osmo Suovaniemi (M.D, Ph.D.), founder of Labsystems (1971), Eflab (1978) and Biohit (1988) together with his team developed and commercialised the first air displacement, adjustable single and multichannel pipettors that made liquid handling both more convenient and safer than before. These inventions included the first 8- and 12-channel adjustable pipettors that were designed to aid the liquid handling work in the vertical photometry based analysers, such as the very first 96-well microplate reader (the Titertek Multiskan), invented and developed by Professor Suovaniemi (and his company Labsystems).

Over the years, Biohit's liquid handling devices have taken their place in laboratories worldwide as ergonomic, safe and reliable solutions for all types of pipetting and dispensing.

Today, Biohit's mission is to enhance the well-being and quality of life of people by developing, manufacturing and marketing liquid handling products and accessories as well as diagnostic test systems for use in research, health care and industrial laboratories.

In addition to liquid handling products and accessories, Biohit also develops, manufactures and markets diagnostic test systems for the screening, prevention, and diagnosis of diseases of the gastrointestinal tract.

The company's diagnostic tests are combined with pipettors, instruments based on vertical photometry technology, and related software to provide comprehensive analysing systems for research and clinical diagnostics.

Biohit focuses on business areas in which it possesses a strong foundation in research, technology, innovations and patented products. The company's products are designed and manufactured according to the requirements of the ISO 9001, ISO 13485, and ISO 14001 quality and environment standards. Biohit also offers accredited pipettor calibration according to ISO 17025. Additionally, all products are CE/IVD marked. Biohit has several worldwide patents and patents pending for its products.

Biohit has a network of 450 distributors, including 7 subsidiaries, in 70 countries.

Further information on Biohit is available at **www.biohit.com**.

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